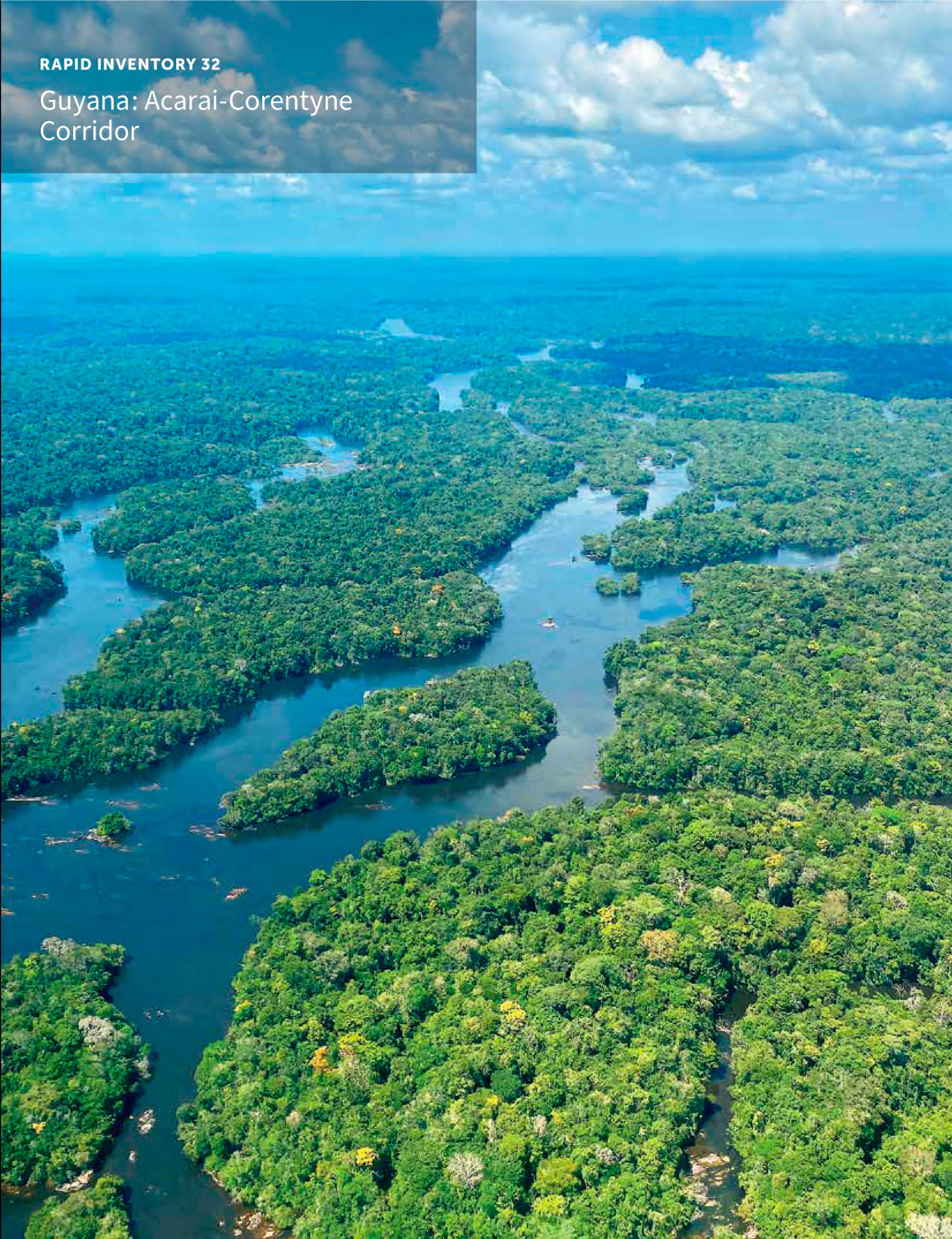
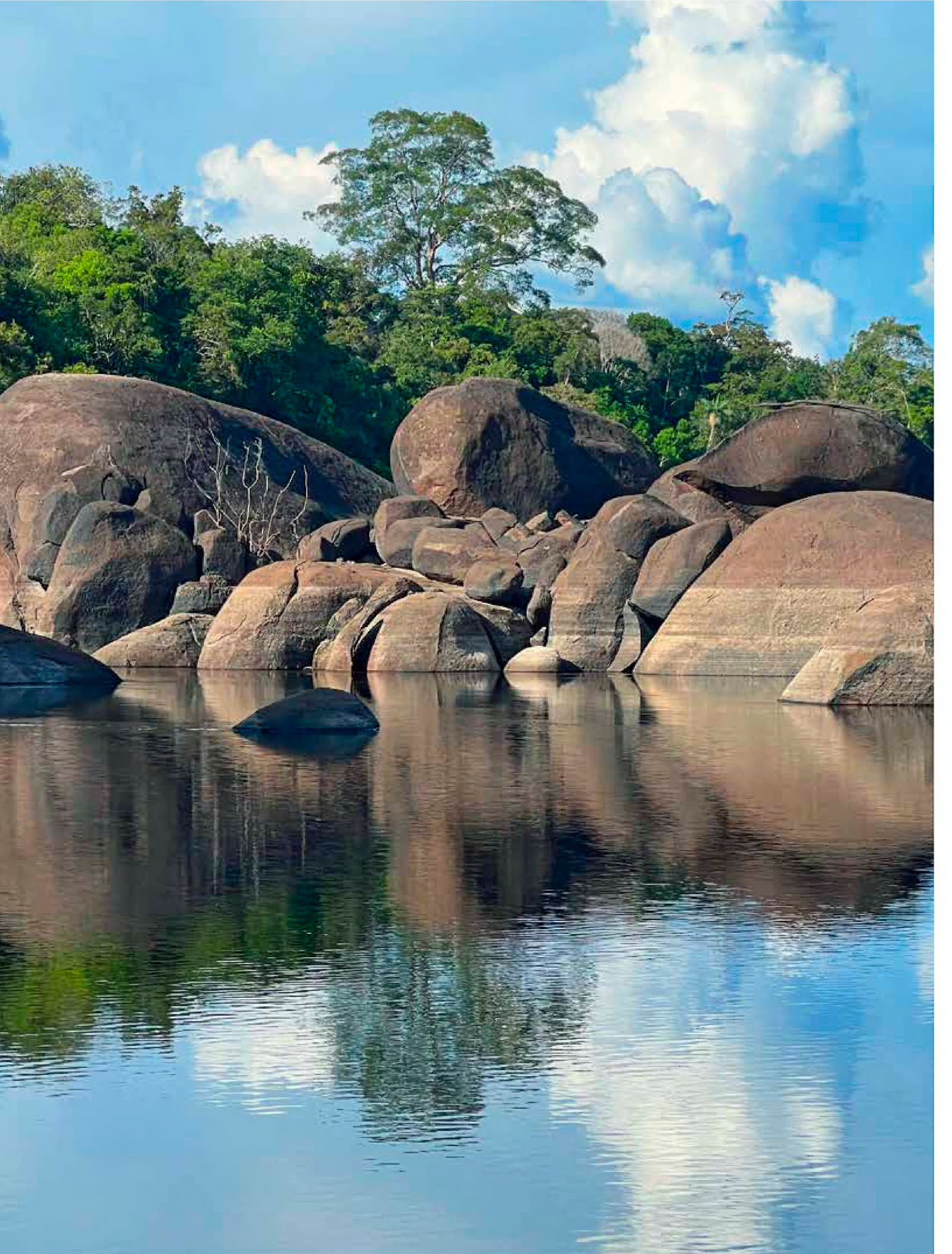
RAPID INVENTORY 32

Guyana: Acarai-Corentyne Corridor





rapid biological and social inventories

REPORT NO. 32

Guyana: Acarai-Corentyne Corridor

Nigel Pitman, Cameron Rutt, Lesley S. de Souza, R. Elliott Oakley, Farah Carrasco-Rueda, Sophie Picq, and Jeremy M. Campbell

editors

July 2025

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Guyana Environmental Protection Agency	Villages of Masakeñarî, Parabara, and Cashew Island (Kasuela)
Conservation International-Guyana	University of Guyana
Frankfurt Zoological Society-Guyana	South Rupununi Conservation Society
Map of Life	

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About the cover

Front cover: Spanning 1.5 million hectares of spectacular rainforests and mountain ranges in southern Guyana, the Acarai-Corentyne Corridor protects the headwaters of Guyana's four largest rivers: the Essequibo, the Corentyne, the Berbice, and the New (pictured here).

Inner cover: Submerged in the rainy season by whitewater and whirlpools, billion year-old boulders along the Essequibo River, many etched with ancient petroglyphs, bake in the dry season sun.

Back cover: The corridor's monumental biodiversity and invaluable ecosystem services are complemented by a deep knowledge of this landscape held in nearby Indigenous communities of the Waiwai, Trio, Wapishana, and Macushi people.

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PERMITS

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- Guyana Wildlife Conservation and Management Commission Research Export Permits FI/LD/1/2024 (reptiles), FI/LD/10/2024 (amphibians), FI/LD/25/2024 (mammals), FI/LD/26/2024 (fishes), and FI/LD/66/2024 (plants), valid from 27 December 2024 through 22 June 2025

- US Fish and Wildlife Service Declaration for Importation or Exportation of Fish or Wildlife, Dec Control Number 2025655990, valid starting 17 January 2025

- Approval by the Institutional Review Board of the Field Museum of Natural History, valid starting 27 September 2024

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- Independent agreements signed in September 2024 by the Field Museum and the toshaos of Masakeñarî, Parabara, and Cashew Island (Kasuela) villages regarding villagers' participation in the advance work and rapid inventory

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Field Museum of Natural History

The Field Museum is a research and educational institution with exhibits open to the public and collections that reflect the natural and cultural diversity of the world. Its work in science and education—exploring the past and present to shape a future rich with biological and cultural diversity—is organized in centers that complement each other. The Keller Science Action Center puts its science and collections to work for conservation and cultural understanding. This center focuses on results on the ground, from the conservation of tropical forest expanses and restoration of nature in urban centers, to connections of people with their cultural heritage. Education is a central strategy of all centers: they collaborate closely to bring museum science, collections, and action to its public.

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Guyana Protected Areas Commission

Established by the Protected Areas Act of 2011, the Protected Areas Commission is the government body responsible for establishing, managing, maintaining, promoting, and expanding Guyana's National Protected Areas System (NPAS). The Commission directly manages Shell Beach Protected Area, Kaieteur National Park, Kanuku Mountains Protected Area, and the Urban Parks, and provides technical support to two other Guyanese protected areas, Iwokrama Rainforest Reserve and Kanashen Amerindian Protected Area. The commission identifies and evaluates areas that are of ecological significance and makes recommendations for the establishment of new protected areas; and ensures that the NPAS contains ecologically viable areas that are representative of Guyana's habitats and ecosystems.

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Guyana Environmental Protection Agency

As Guyana's national focal point for the Convention on Biological Diversity, the Environmental Protection Agency (EPA) is responsible for coordinating and maintaining a program for conservation of the country's biological diversity; establishing and maintaining national parks and protected areas and a wildlife protection management program through means including coordination with other Agencies, regulation, and development and implementation of strategies and action plans; and acting as the statutory authority to approve development projects that impact the environment. The EPA's mandate also includes the dissemination of national and international reports regarding the status of the environment in the State of the Environment Report and to the UN Convention on Biological Diversity towards reaching their commitments.

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Villages of Masakeñarî, Parabara, and Cashew Island (Kasuela)

Masakeñarî Village is located in Guyana's Region 9, on the Essequibo River. Since 2004 the Waiwai community of approximately 350 people holds legal land title to a 625,000-ha territory, stretching from their village south and west to the Guyana-Brazil border. Masakeñarî declared their lands as a community-owned conservation area in 2007, partnering with Conservation International-Guyana. In 2019, the Kanashen Amerindian Protected Area joined Guyana's National Protected Area System, becoming the country's first and only Indigenous-managed protected area.

Parabara Village is located in Guyana's Region 9, on the Kuyuwini River. The Wapishana and Waiwai community of approximately 200 people has documented important social and biological places known by residents as well as community-conserved areas for a proposed territory bounded by the Kuyuwini River to the north and the Kassikaityu River to the south, and stretching from the Guyana-Brazil border in the west to the Essequibo River in the east. In May 2025, the Minister of Amerindian Affairs announced Parabara will receive land title after its yearslong wait, though the boundaries were not finalized at the time of publishing this report (June 2025).

Cashew Island (Kasuela) Village is located in Guyana's Region 6, on the New River. The Waiwai and Trio community of approximately 60 people currently does not have legal land title and has not applied. Located immediately south of the Guyanese military base Camp Jaguar, some residents provide support work for the Guyana Defence Force. The community utilizes areas along both sides of the New River for subsistence activities as well as parts of the Corentyne River and its tributaries.

Conservation International-Guyana

Conservation International-Guyana is a Guyanese registered and staffed affiliate of Conservation International (CI). Since 1987, CI has worked to build on a foundation of science, partnership, and field work to help find holistic, enduring, and sustainable solutions to national and global problems. Working at every level of society, CI has helped protect more than 6 million square kilometers of land and sea across more than 70 countries. We deliver impact through offices in more than two dozen countries and a worldwide network of thousands of partners.

CI-Guyana utilizes its three decades of experience, science, expertise, and global reach to help realize Guyana's development with nature. We boast strong local capacity to design and implement effective solutions that respond to local and national priorities. CI-Guyana supported the establishment of Guyana's National Protected Areas System and led processes for the establishment of the Kanuku Mountains and Kanashen Amerindian Protected Areas.

CI has a long history of work in and around the Acarai-Corentyne Corridor including rapid biodiversity assessments in nearby Kanashen Amerindian Protected Area, Kanuku Mountains Protected Area, and Estação Ecológica Grão-Pará, as well as the 2002–2012 management of the former Upper Essequibo Conservation Concession in the northern portion of the corridor.

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University of Guyana

Established in 1963, the University of Guyana now operates eight campuses with eight academic divisions and 10 research institutes and centers and currently serves over 11,500 students. The University's mission is to discover, generate, disseminate, and apply knowledge of the highest standard for the advancement of communities, the nation, and mankind within an atmosphere of academic freedom, transparent accountability, pragmatic innovation, and universal respect. The aims of the University are to provide a place of education, learning, and research of a standard required and expected of a university of the highest standard, and to secure the advancement of knowledge and the diffusion and extension of arts, sciences, and learning throughout Guyana.

Opened in 1992, the University of Guyana's Centre for Study of Biological Diversity (CSBD) houses the National Herbarium and the Zoological research collections (approximately 50,000 plant specimens and over 29,000 animal specimens). The Centre serves both the University and the nation in the facilitation of biodiversity research and the promotion of biodiversity conservation and management. The collections of the CSBD represent a complete set of all specimens collected through scientific research in Guyana. There are also sister collections that are distributed among many institutions worldwide.

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Frankfurt Zoological Society (FZS), headquartered in Germany, is an internationally operating nature conservation organization that has been supporting conservation projects in Africa, South America, Southeast Asia, and Europe for many decades. Following its mission to conserve wildlife and ecosystems, FZS focuses on protected areas and outstanding wilderness places through long-term support and partnerships with local communities, conservation authorities, national park administrations, and other NGOs. In South America, FZS concentrates its efforts on the Amazon rainforest and has expanded its engagement in the region in recent years.

Since 2014, FZS has been supporting the Protected Areas Commission in system-wide planning and institutional development for the National Protected Area System and managing the Kanuku Mountains Protected Area (KMPA). Following the elaboration of the Guyana's Low Carbon Development Strategy 2030, FZS has expanded its support to the Government of Guyana through the establishment of a national sister organization, Frankfurt Zoological Society-Guyana, in 2023 and a new program focus to designate new protected areas in Guyana by 2030 and ensure their effective management. In addition, FZS continues to support the KMPA in the areas of ranger force development, biodiversity knowledge and ecological monitoring, environmental education and awareness, and stakeholder and community engagement.

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South Rupununi Conservation Society

Since 2002 the South Rupununi Conservation Society (SRCS) has aimed to preserve the wildlife, environment, and culture of the Rupununi of Guyana through community-based conservation, environmental education, and research. We are farmers, hunters, school children, business people, tour operators, teachers, tour guides, and more. We are the women, men, and children who call the Rupununi our home.

Over the years, we have seen a decline in the number of animals and plants of the Rupununi region as well as continued degradation of the natural environment. Through education, research, and conservation we are dedicated to sustaining and protecting the wildlife of our home.

We are focused on Environmental Education, Red Siskin research and conservation, Giant Anteater research and conservation, Yellow Spotted River Turtle research, Giant Armadillo research and conservation, monitoring the impact of fire on wildlife, preservation of Traditional Knowledge, creating Young Climate Change Leaders, research into undiscovered mammals, and Hoary-throated Spinetail and Rio Branco Antbird research and conservation.

Through these initiatives, SRCS continues to strengthen the relationship between people and nature, promoting sustainable livelihoods while protecting the unique biodiversity of the Rupununi region.

South Rupununi Conservation Society
Wichabai Ranch
South Rupununi, Region 9, Guyana
www.srcs-gy.com

Map of Life

Map of Life is a Yale University-based initiative that supports effective conservation outcomes by delivering biodiversity insights for locations anywhere. By integrating standardized global metrics, innovative survey technologies, and cutting-edge informatics tools, we provide comprehensive biodiversity measurement and decision-support solutions.

Map of Life and the Field Museum have long worked together on two initiatives relevant for the conservation of biodiversity in Guyana. One is Map of Life Regions, an online tool that generates standardized lists of expected plant and animal species for every country, region, and protected area on Earth based on global biodiversity datasets. Another is the Map of Life Rapid Assessments (MOLRA) team, formed as part of the XPRIZE Rainforest competition with the goal of developing new methods to revolutionize the documentation and monitoring of biodiversity in tropical forests. Six members of the team for the rapid inventory described in this report were members of the MOLRA team, which was awarded second place in the competition while we were in the field.

Map of Life
Jetz Lab
Department of Ecology and
Evolutionary Biology
Yale University
165 Prospect Street
New Haven, CT 06520-8106 USA
www.mol.org

ACKNOWLEDGMENTS

We feel privileged to have carried out this work during a moment in Guyana's history in which institutions across the country are expressing a new resolve to conserve biodiversity in ways that are effective, equitable, and scientifically rigorous. Government leadership has set the stage for this work, from the **Low-Carbon Development Strategy** to the **Office of the President**. We are deeply grateful for the vision and leadership of the President of Guyana, His Excellency Dr. Mohamed Irfaan Ali. The work described in this report benefited greatly from the advice, experience, and support of Vice President Bharrat Jagdeo, Senior Director of Climate Change Pradeepa Bholanath, and Major General Joseph Singh.

We are honored to collaborate with the **Protected Areas Commission** (PAC) of Guyana, which works to establish, manage, maintain, promote, and expand the country's protected areas system. This work would not be possible without the leadership of former Commissioner Jason Fraser, Deputy Commissioner Fitzroy Sealey, and the **PAC Board of Directors**. That board includes Chairman Foreign Secretary Robert M. Persaud, Vice Chairman Roger Yearwood, Brian James, John Carpenter, Ronald Harsawack, Pradeepa Bholanath, and Omodelle George, as well as ex officio members Damian Fernandes (Advisor to the Board and PAC), Kemraj Parsram (Executive Director, **Environmental Protection Agency**), Joslyn McKenzie (Permanent Secretary, **Ministry of Natural Resources**), and Ryan Toolsiram (Permanent Secretary, **Ministry of Amerindian Affairs**). Many dedicated staff at the PAC participated in the field portion of this rapid inventory; several others contributed to its success from the Georgetown office, including Anupa Puran, Ivana Thompson, Preston Paul, Rayon McGregor, Derissa David, Steven Husbands, Nadia Hunte, Rameena Mangel, and Ashley Bishop. We thank PAC staff who provided letters of support to the Guyana Police Force for bringing materials, gear, and other equipment through Guyana Immigration and Customs. This rapid inventory is one of several projects the Field Museum has the privilege of working on with Guyana's **Environmental Protection Agency (EPA)**. We thank Executive Director Kemraj Parsram for his vision and support, as well as the EPA staff who participated in the inventory and aided in issuing the research permit and material transfer agreement. This includes Sherry Pereira, field team members Nehru Narine and Christopher Bhola, as well as Felicia Adams-Kellman, who participated in the post-inventory workshop.

A large number of other people, agencies, and ministries in the Guyanese government were instrumental in the execution of this work. We thank the **Guyana Defence Force (GDF)**, GDF Chief of Staff Brigadier Omar Khan, Colonel Sheldon Howell, Lieutenant Roberts, and the officers stationed at Camp Jaguar for their helpful assistance in the field and logistics planning. The **Guyana Forestry Commission (GFC)** provided invaluable assistance in the form of maps, reports, and other documents relevant to understanding previous work in the Acarai-Corentyne Corridor. We are especially grateful for the assistance of GFC Commissioner Rawle Lewis and Assistant Commissioner Lashanna Lillie-Perkins. The **Guyana Hydrometeorological Service** provided technical assistance to help us understand the climatological landscape of southern Guyana. At Hydromet, we are indebted to Garvin Cummings and Komalchand Dhiram. **Guyana Lands and Survey Commission (GLSC)** provided the base maps we used to plan the rapid inventory and a significant amount of geographic information we used to create new maps. At GLSC, we are especially grateful to Dexter Chacon in Lethem and Naseem Nasir in Georgetown. At the **Ministry of Amerindian Affairs**, we are grateful for the assistance of Minister Pauline Sukhai through meetings with our team.

The **University of Guyana (UG)** and its **Centre for Study of Biological Diversity (CSBD)** were our primary scientific partners in this inventory. In addition to a large number of biodiversity experts who participated in the fieldwork, UG and CSBD also provided laboratory space, assistance processing and storing specimens, advice and assistance procuring fieldwork equipment, and help validating the specimens we collected as part of the export permit process. We are deeply indebted to Gyanpriya Maharaj, Kaslyn Holder-Collins, Elford Liverpool, Louisa Daggers, Mark Bastian, Devya Hemraj-Naraine, Arianne Harris, and Eric Stoll.

Our research permit for the inventory included a proscription against carrying out research in Amerindian villages and we honored that to the letter. In order to reach and carry out research at our remote campsites we did, however, depend on the assistance of villagers in nearby communities. We are deeply grateful for the gracious and tireless work done on behalf of the inventory by dozens of people in the villages of **Masakeñarî**, **Parabara**, and **Cashew Island**. All of these local experts are listed in our team participant list on pages 5–10 of this report. Our special thanks to the toshaos of these villages: Toshao Joseph Ayaw, Toshao Clarence Rudolph, and Toshao Kenke Yaimo, respectively. We also thank Toshao Apollos Isaacs of **Karaudarnau**, who helped arrange last-minute transport to a meeting with Parabara.

As we researched the Acarai-Corentyne Corridor in preparation for the rapid inventory, it became evident again and again how much **Conservation International-Guyana** has contributed to surveys of the region's biodiversity. CI's rapid assessments of **Kanuku Mountains Protected Area**, **Kanashen Amerindian Protected Area**, and **Kwamalasamutu** in neighboring Suriname, as well as the CI-supported biodiversity inventory of the Grão-Pará Ecological Station just south of the Guyana-Brazil border, represent some of the most important biodiversity data for this area of the world. Likewise, CI-Guyana's decade of experience managing the Upper Essequibo Conservation Concession (now defunct) made it a font of information regarding the corridor itself. CI-Guyana was a hugely important and consistently gracious partner in the execution of this project. Our sincere thanks go to Curtis Bernard, René Edwards, Damian Fernandes, Annalise Bayney, and all other staff who supported this work.

While it has a shorter history in Guyana, **Frankfurt Zoological Society-Guyana (FZS)** also played a key role in this inventory. During

the preparatory phases we came to rely on Chuvika Harilal for her long experience in Guyanese conservation and her deep understanding of how it works. We are honored to be partners with FZS in Guyana and Peru and feel very fortunate to have had FZS-Guyana staff Alex Stewart on the field team.

Our favorite Guyanese grassroots conservation group is the **South Rupununi Conservation Society**, of which Asaph Wilson participated on the inventory team and Fernando Li provided crucial logistics support. For their advice and insight, for their companionship and encouragement, we salute Neal Millar, Alyssa Melville, Erin Earl, Leroy Ignacio, Justin de Freitas, Maya de Freitas, Kim Spencer, Kayla de Freitas, and the rest of the SRCS team.

As it does for an increasing number of conservation projects around the world, the team at **Map of Life** provided invaluable biodiversity insights that put our field data into a global context. We put Map of Life tools and data to good use before the inventory, during the inventory, and after the inventory, and we expect them to play a long-term role in showcasing and facilitating management of the Acarai-Corentyne Corridor's biodiversity.

Bob Stallard (geology) would like to thank the **Smithsonian Tropical Research Institute** (especially Erik Johnson of the Analytical Biogeochemistry Lab), the **US Geological Survey**, and the **University of Colorado Institute for Arctic and Alpine Research** for access to facilities. Kavin Ayaw, Stephen Suse, Simeon Mawasha, Ronell Lewis, Sophie Picq, and Mariel Vandegrift provided field support. Numerous people provided rock samples, more than I can remember, thanks! I kept samples from Nigel Pitman and Elliott Oakley. Micki Kaplan and Elias Stallard-Olivera provided home support.

The plants team would like to thank Angeleek McAllister, Savetrie Goulcharran, and Eric Stoll for spending the long hours necessary to dry our plant specimens at the **University of Guyana**. We are also indebted to Seon Hamer of the **University of Guyana** and Gary Krupnik at the **Smithsonian Institution** for their insights on the Guyanese flora. Kimberly Hansen, Nancy Hensold, Darlene Dowdy-Pritchett, Lucia Kawasaki, and Matt von Konrat all played key roles in processing our plant specimens in the Field Museum herbarium. We thank Marion Jansen-Jacobs for mailing us an unpublished report on a botanical survey of the Rewa headwaters; Rachael Gallagher and Stuart Allen for providing a list of plant species endemic to Guyana; and Bruce Hoffman for providing a digital version of *Lianas of the Guianas*. We are indebted to the **iNaturalist** community and especially Luis Torres Montenegro for identifying a large number of plants uploaded to that platform. We thank Rawle Lewis at the **Guyana Forestry Commission** for providing detailed methods of Guyana's National Forestry Inventory and Nina Witteveen and Crystal McMichael at the **University of Amsterdam** for the lab work needed to sample charcoal and pollen in the soil cores we collected. Zareefa Bacchus and Jamaine Samuels helped us obtain the necessary permits to export those soil samples. Thank you to all the team members who brought us flowers, fruits, plant photos, duct tape, and chocolate bars during the fieldwork.

The fish team would like to thank all the folks mentioned above for making this expedition possible, especially our friends at **University of Guyana** and the **Environmental Protection Agency** who facilitated collecting gear, streamlined the permit procedure and inspections, and helped us in many ways to make life easier for us. We are greatly beholden to the many local people who piloted our boats, put out and retrieved our gill nets, tirelessly threw our cast net, helped us pull our drag nets and kick fish out of the rocks, and in many other ways shared their knowledge on how to catch fishes. Without their help, our results section would be much shorter! On the home front, Don thanks his siblings, Su Gerler, Cindy Glaenzer and Mike Taphorn; Lesley would like to thank her sister Patricia de Souza for help with Charlie; Devya thanks her husband Mikhel Naraine; Onesimus thanks his wife Indra Rudolph; Allister would like to thank his mother, Cheryl Henry. For their help with supplies and logistics and especially the painstaking work of preparing hundreds of tissue vials and labels we thank the heroes of the **Field Museum** fish collection: Caleb McMahan, Andrew Gallardo, Susan Mochel, Kevin Swagel, and their many volunteers. We also thank Philip Willink for sharing information about the 2007 fish collections made in the former Upper Essequibo Conservation Concession in the middle Essequibo River basin.

The herpetology team would like to thank Andrew Snyder for logistical preparation, advice, and help in writing up the report and Jason Brown for loaning field equipment. We also want to thank the **Centre National de la Recherche Scientifique** (CNRS), the **Université Paul Sabatier** (Toulouse, France) and the **Centre d'Etude sur la Biodiversité Amazonienne** (CEBA, ref. ANR-10-LABX-25-01) and **Fundação de Amparo à Pesquisa do Estado de São Paulo** (FAPESP) for their support. Our thanks also go to the **University of Guyana** and **Centre for Study of Biological Diversity**, notably Mark Bastian for helping with the export of material and letting us visit the collection. Lastly, we owe a significant debt of gratitude to our extended team—all those who provided new records or specimens and contributed immensely to enriching the species inventory.

The bird team would like to thank the **eBird** team and the **Cornell Lab of Ornithology** for data support; Brian O'Shea for direction to regional resources, Guyanese ornithological context, and identification assistance; Mario Cohn-Haft for generous expertise on birds of the Guiana Shield; and Dan Lane for confirmation of vocalizations. We thank the **Protected Areas Commission** and Toshao Joseph Ayaw for permitting passage through the **Kanashen Amerindian Protected Area** and the opportunity for Kwang Suse to gain valuable experience with ecotourism and bird guiding, as well as the **South Rupununi Conservation Society** for supporting Asaph Wilson's participation in the inventory.

The mammals team would like to thank the **Masakeñarî**, **Parabara**, and **Cashew Island** teams for their hospitality, as well as the **Protected**

Areas Commission and the Field Museum for the opportunity. We are indebted to Fernando and Rhomayne Li (**Li Logistics**) and Waiyapney Zammette (**Frankfurt Zoological Society-Guyana**) for their support in organizing the collection and transport of the camera traps from Lethem to the rapid inventory sites. We thank the **World Wildlife Fund-Guianas**, **Rupununi Wildlife Research Unit**, and Chuvika Harilal (**Frankfurt Zoological Society-Guyana**) for loaning the camera traps; Mark Johnston for providing AudioMoth units and their cases and lending GPS units; Dr. Eric Hellgren from the Department of Wildlife Ecology and Conservation at the **University of Florida** and John Lukas from the Conservation Department at the **Jacksonville Zoo and Gardens**; and the **University of Guyana** Department of Biology for their support. We are indebted to our friends from **Masakeñarî** and **Cashew Island**—Mark Suse, Ricardo Ayaw, Demetro Shu-shu, Tikkil Kenke, Matthew Marawanaru, Albert Yaimo, and Reuben Yamochi—without whom this would have been nearly impossible. We thank the camp logistics team—Álvaro del Campo, Paúl Sambrano, and Aldo Villanueva—for making our days before, during, and after the inventory as smooth as possible. We are grateful to the rangers from **Kaieteur National Park** and **Kanuku Mountains Protected Area**, Wenceslaus Washington and Octavious Hendricks, for their hard work and dedication provided to the advance team. Thank you to our tech wizards—Zach Kachian, Josué Gabriel Yarlequé Ipanaqué, and Karen Klinger—for their patience and accommodation of our requests.

We are indebted to Eric Stoll and Gyanpriya Maharaj from the **Centre for Study of Biology Diversity** for receiving and processing our bat specimens and samples; to Marcos Ríos, Sophie Picq, and Cecilia Dávila for their support in acquiring equipment and materials for our bat surveys; Bruce Miller, for his support in troubleshooting problems with the acoustic analysis software; and Adam Ferguson and Lexi Frank, for their support with defining the bat sample collection protocol and materials. We would also like to thank our fellow camp members who offered assistance via opportunistic sightings. Finally, a big thanks to the animals for showing up (except for you, phyllostomid bats… may we reconcile in the future)!

The environmental DNA team would like to thank Oliver Stringham for his assistance with coding, Julie Lockwood for her assistance with equipment, and Christopher Eddy for his assistance with generating figures at **Rutgers University**. At the **University of Guyana** we thank Mark Bastian, Eric Stoll, and Gyanpriya Maharaj. We are indebted to pilots Cleon Melville and Damian 'Woody' Woodruff. We thank **Michigan State University** High Performance Computing Center for computing power. Thank you to Walter Jetz and the **Map of Life Rapid Assessments** team for the loan of equipment and the support and encouragement. We would also like to thank the local experts and boatmen, without whom none of this would be possible.

The local ecological knowledge team would like to thank Toshaos Clarence Rudolph (**Parabara**), Joseph Ayaw (**Masakeñarî**), and Kenke Yaimo (**Cashew Island**) and their Village Councils for their enthusiasm for community participation and clear vision for the contribution of local knowledge to biodiversity research. Kayla de Freitas (**South Rupununi Conservation Society**) and Louisa Daggers (**University of Guyana** Amerindian Research Unit) were consistent supporters in Guyana and shaped our methodological design and analysis. From Chicago, Paula Ungar and Cecilia Dávila made invaluable contributions to the research tools, materials, and principles that guided data collection. Chris Jarrett and Alaka Wali provided formative insights from past rapid inventories. Laura Mentore, George Mentore, and Chris Shaffer each shared an abundance of insight on this region of Guyana for which we are deeply grateful. Alex Bentley kindly recommended tools for participatory data collection. Thank you to Donny Charley for coordination from **Masakeñarî**; to Bernicia Chekema for her steadfast insight from Georgetown; to Margaret Augustus for translation and coordination support before fieldwork; and to Syeada Manbodh for creating home away from home at the **Rainforest B&B** across many preparatory trips to Guyana.

The GIS team expresses their gratitude to Dawn Martin for logistical support and technical acquisitions and Mark Johnston for his GIS expertise during the planning stages.

Several members of our field team are parents, wives, husbands, and partners whose long absences from home during the field portion of the inventory were only possible thanks to weeks of childcare and housekeeping taken on by loved ones who kept the home fires burning and supported us with encouragement and inspiration. These behind-the-scenes heroes include Patricia de Souza, Chuck and Twing Pitman, Charlie Pitman, Madeline Otis Campbell, Michelle Ouelette, Flip and Lulu Campbell, Kathy and Ron Campbell, Tom and Juli Hallett, Brittany Bankovich, Javy Hallovich, Shelley-Anne and Mark Harris, Michael Prater, Beau Harris, Christina Izbasa, Moci Rueda, Doménica Carrasco, Nkasse Stewart, Josepha Hendricks, Meshach Andres Pierre, Wenceslaus Washington's family, Christy Nowicki, Barbara and Franklin Holder, Allister Collins, Katie Riordan, Sarah Zillioux, Michelle Zillioux, Marina Maximiano, Dawn and Al Oakley, Milagritos Reátegui, and Sofía del Campo.

Other colleagues and partners who provided important support at crucial moments include Jake Bicknell (Bicknell et al. 2017), whose priority areas analysis sparked early conversations about the importance of this region of Guyana for conservation; Amy Rosenthal, who as the former director of the **Keller Science Action Center** was instrumental in obtaining funding for the project; and Enrique Ortiz of **Andes Amazon Fund**, who offered key insights into thinking about how biodiversity financing opportunities might help support the **Protected Areas Commission's** long-term goals.

The success of this research depended on chartered flights to and from remote airstrips. During the advance work and the inventory we chartered at least 20 flights—sometimes as many as four on the same day—to ferry the team from one spot to another. For their efficiency and professionalism in orchestrating these complex transfers, we are

primarily indebted to **Trans Guyana Airways**, and especially to the amazing Oshana Rogers at **SkyWest Charter Services**. We thank **Jags Aviation** for a number of chartered flights.

In Georgetown we depended on **El Dorado Transportation** for everything from airport transfers in the dead of night to storing hundreds of kilos of food supplies to getting us around town on the million and one errands the inventory demanded. Our sincere thanks to Richard Christian and Jermaine Goddard for their time, patience, and recommendations. Other taxi drivers in Georgetown who assisted us repeatedly were Jamal Thomas, Floyd Alexander, and Troy Corlette.

Funding for this rapid inventory came from a number of different sources, but the work was only possible because of a generous grant from the **Walder Foundation**. Thanks to the foundation's long-term vision, that grant includes funds not only for the rapid inventory described in this report but also for an expert exchange program that funds biodiversity experts based in Guyana to work at the **Field Museum** in Chicago and biodiversity experts based in Chicago to work in Guyana with Guyanese institutions; for targeted biodiversity projects in other parts of Guyana; and for the creation of new tools and resources to advance biodiversity science and conservation throughout the Guiana Shield.

Funding from the **Keller Science Action Center** and its many supporters was also central to the preparation, execution, and follow-up of this rapid inventory. We are deeply, deeply honored by the trust placed in us by our generous community of supporters.

Once again we are honored to thank Jim Costello and his team at **Costello Communications** for their amazingly quick and efficient help in the long process of turning our jumble of field notes into a polished report. There is a good reason why we have worked together on 32 rapid inventory reports in a row.

At the **Field Museum** we are profoundly grateful for the steady leadership and support of Julian Siggers, Bobby Mehta, Thorsten Lumbsch, and Erin Hagen. Karsten Lawson was extremely helpful as our emergency contact, while Meganne Lube and Jasmine Wilson-Savoury handled hundreds of budget lines and receipts with poise. Thank you to our communications team, Marylita Poma, Kate Golembiewski, and others, for promoting the press campaign in Chicago. Sharon Grant, Kate Webbink, Janeen Jones, and Pete Herbst helped us navigate many of the complex data management challenges posed by the inventory, for which we are truly grateful. David Bailey, Nina Cummings, Melissa Anderson, Elizabeth McKinley, and Armand Esai provided expert help in tracking down books, reports, and other information about prior expeditions to Guyana. Dawn Martin and Rowan Mullins managed an abundance of requests for support, always delivering to strengthen the team. Debby Moskovits provided invaluable early contributions and sustained connections to wider conservation efforts to strengthen the work.

DAWN J. MARTIN
1973–2025

We honor the memory of Dawn Martin, a steadfast advocate, connector, and champion of conservation without borders. Through her work with the Keller Science Action Center at the Field Museum, Dawn played an essential role in the rapid inventory program, from its early days in Peru to expeditions in Ecuador, Colombia, and now Guyana. With extraordinary foresight and problem-solving grace, she helped bridge communities, researchers, and policymakers. She reminded us that conservation is about nature, people, dignity, and enduring relationships.

Dawn's spirit and legacy continue to guide our work. Her impact will always be felt in the forests, rivers, and communities she helped protect, and in all of us who had the privilege of working alongside her.

The rapid inventory of the Acarai-Corentyne Corridor was designed to provide actionable information on the biodiversity, ecological integrity, and human-environment interactions within a 1.3 million-hectare expanse of southern Guyana. The boundaries of that area were shared with us by Guyana's Protected Areas Commission (PAC) in May 2024 and used to plan and carry out our November 2024 fieldwork.

While our team was in the field, the PAC saw an opportunity to expand the area of interest to >1.5 million hectares. As a result of that process, the PAC created a new polygon in November 2024, extending the original boundaries northward to incorporate the headwaters of the Berbice River. The inclusion of the Berbice headwaters significantly enhances the corridor's conservation potential by safeguarding a broader suite of aquatic and terrestrial ecosystems and ensuring the protection of the headwaters for Guyana's largest rivers. This expansion represents a major step forward in Guyana's commitment to biodiversity conservation, climate resilience, and water security at a national scale.

Because the rapid inventory described in this report was focused on the initial 1.3 million-hectare corridor, we did not sample biodiversity or engage communities in some important areas now under consideration. Areas in the extended polygon whose successful management will require additional baseline fieldwork include the headwaters of the Berbice, the ~100-km stretch of the Corentyne River downstream from its junction with the New River, and the stretch of the Essequibo in the vicinity of Apoteri. As Guyana's conservation planning advances, we stand ready to support further research, community engagement, and policy development to solidify long-term protections for this extraordinary landscape.

The map on the facing page shows both the initial polygon used to plan the rapid inventory and the larger, extended polygon now under consideration. For the sake of clarity, in this report we call the entire area the Acarai-Corentyne Corridor. Where necessary, we refer to the initial polygon as the Rapid Inventory Study Area.

Iwokrama Rainforest
Berbice River
Apoteri
Annai
Yakarinta
Rewa
Crash Water
SURINAME
GUYANA
Cocoa Creek
Rewa River
ACARAI-CORENTYNE CORRIDOR
Kanuku Mountains Protected Area
Camp Jaguar
Cashew Island (Kasuela)
Shea
Maruranau
Awarewaunau
Essequibo River
Corentyne River
New River
Kuyuwini River
Oronoque River
Parabara
Monkey Jump River
Xapika Creek
Kassikaityu River
Kanashen Amerindian Protected Area
Gunns Strip
Masakeñari
ACARAI MOUNTAINS
BRAZIL
N
0 15 30 60 km
Main campsite
Satellite campsite
Village
Landing strip
Rapid or fall
Protected area
Rapid inventory study area

The goal of rapid inventories—biological and social—is to catalyze effective action for conservation in threatened regions of high biological and cultural diversity and uniqueness.

Approach

Rapid inventories are expert surveys of the geology and biodiversity of remote forests, paired with social assessments that identify natural resource use, social organization, cultural strengths, and aspirations of local residents. After a short fieldwork period, the biological and social teams summarize their findings and develop integrated recommendations to protect the landscape and enhance the quality of life of local people.

During rapid biological inventories scientific teams focus on groups of organisms that indicate habitat type and condition and that can be surveyed quickly and accurately. These inventories do not attempt to produce an exhaustive list of species or higher taxa. Rather, the rapid surveys 1) identify the important biological communities in the site or region of interest, and 2) determine whether these communities are of outstanding quality and significance in a regional or global context.

During social inventories scientists and local communities collaborate to identify patterns of social organization, natural resource use, and opportunities for capacity building. The teams use participant observation and semi-structured interviews to quickly evaluate the assets of these communities that can serve as points of engagement for long-term participation in conservation.

In-country scientists are central to the field teams. The experience of local experts is crucial for understanding areas with little or no history of scientific exploration. After the inventories, protection of natural communities and engagement of social networks rely on initiatives from host-country scientists and conservationists.

Once these rapid inventories have been completed (typically within a month), the teams relay the survey information to regional and national decision-makers who set priorities and guide conservation action in the host country.

Rapid Inventory 32 by the numbers

20
DAYS

78
PARTICIPANTS
FROM 13 INSTITUTIONS AND 3 VILLAGES

11
NATIONALITIES
(INCLUDING 3 INDIGENOUS PEOPLES)

7
SCIENTIFIC DISCIPLINES

∞
QUESTIONS

20
CHARTERED FLIGHTS

10
DUGOUT CANOES

3
CAMPSITES

140 KG
OF FARINE AND CASSAVA

6.7 KG
OF INSTANT COFFEE

81.3 KM
OF TRAILS EXPLORED

>100 KM
OF RIVER TRAVELED

900
HOURS OF RECORDINGS
(BIRDS AND BATS)

75 K
PHOTOGRAPHS
(PLANTS AND ANIMALS)

4200
MUSEUM SPECIMENS

>350
INDIGENOUS NAMES
(FOR SPECIES, PLACES, AND HABITAT TYPES)

97
ENVIRONMENTAL DNA SAMPLES

1.5 TB
OF BIODIVERSITY DATA

2
JAGUAR ENCOUNTERS

1
FULL MOON

Acarai-Corentyne Corridor by the numbers

1.5
million hectares

~7%
of Guyana's land surface

275 km
from the Guyana-Brazil border in the south to the headwaters of the Berbice River in the north

73–873 m
above sea level

3.4 billion
year-old surface geology

>90%
mixed upland forest, interspersed with patches of swamp and floodplain forest

>900 km
of three of Guyana's largest rivers (Essequibo, New, and Corentyne)

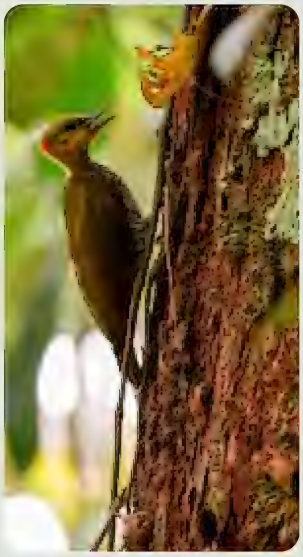
hundreds
of rapids, waterfalls, and river islands

thousands
of km of forest, creeks, and streams

>800 million
trees large enough to sling a hammock from

hundreds
of petroglyphs, historic settlement sites, and other signs of a long human history

192
mammal species



>440
bird species

178
amphibian and reptile species

>400
fish species

>2000
plant species

trillions
of individual organisms

EXECUTIVE SUMMARY

In mid-2024 the Field Museum rapid inventory team was invited by Guyana's Protected Areas Commission to carry out a survey of biodiversity in an area of interest in southern Guyana referred to as the Acarai-Corentyne Corridor throughout this report. The goal of the survey was to generate baseline information to inform future conservation decision-making.

EXECUTIVE SUMMARY

Region

The Acarai-Corentyne Corridor is a 1.5 million-hectare expanse of wild forests, creeks, and mountains in southern Guyana. Bounded by two of Guyana's largest rivers—the Essequibo to the west and the New River to the east—the Corridor stretches 275 km from the highest peaks of the Acarai Mountains in the south (873 m above sea level) to the lowland forests (73 m) that form the headwaters of the Berbice River in the north. Seventy percent of the corridor occupies a plateau at 200–300 m elevation, where 10 million year-old soils overlie the 2 billion year-old bedrock. Most of the landscape is dominated by mature upland forests.

This is one of the least-explored areas of Guyana, notoriously difficult to access from the north due to the imposing waterfalls and treacherous rapids along the Essequibo, Corentyne, and New rivers. While ours was the first comprehensive biodiversity survey to study the area, Indigenous peoples have been exploring, describing, and using these forests for millennia and know them intimately. Four Indigenous villages lie just outside the border of the corridor.

Sites visited by the research team

Following advance work in October 2024 to build campsites and trail systems, the team sampled biodiversity at the following sites:

Essequibo watershed	
Camp Amuku	5–11 November 2024
Essequibo and New River watersheds	
Camp Monkey Jump	11–16 November 2024
New River watershed	
Camp New River	17–24 November 2024

On 26 November, a portion of the field team held a daylong workshop in Georgetown with 19 other experts in Guyanese conservation. During the workshop we collaboratively identified strengths of the landscape, threats to those strengths, opportunities for conservation, and recommendations for conservation action.

Team and inventory focus

A multicultural, interdisciplinary, and international team composed of 25 biologists, three social scientists, and one geologist from six Guyanese and seven international institutions, as well as 49 local experts from three Indigenous villages, studied geomorphology, water, and soils; local ecological knowledge; vegetation and flora; fishes; amphibians and reptiles; birds; large and medium-sized mammals; bats; and environmental DNA.

Main results

We found biological communities in the Acarai-Corentyne Corridor to be spectacularly diverse and remarkably well-preserved, in both the terrestrial and aquatic spheres. Significantly larger than any of Guyana's five protected areas, the Acarai-Corentyne Corridor also harbors more species and more biomass and provides a greater volume of ecosystem

services. Throughout the corridor robust populations of Guyana's largest vertebrate and most massive tree species flourish alongside ancient petroglyphs that signal a millennia-old tradition of stewardship by Indigenous peoples.

During the 20-day inventory **we recorded more than 600 species of plants and at least 754 species of vertebrates**, out of projected regional totals of >2000 and >1215, respectively. We recorded at least 35 species that are potentially new to science and at least 31 species that had never before been recorded in Guyana. Thirteen of the species we recorded are considered globally threatened. These numbers are preliminary and will increase as eDNA, audio data, and specimens are analyzed more fully. Our recorded species numbers reflect a seasonal bias for some groups, as we sampled at the height of the dry season when amphibians and flowering plants were scarce.

	Species recorded during the inventory	Species expected in the region
Vascular plants	>600	>2000
Fishes	234	>400
Amphibians	47	86
Reptiles	51	92
Birds	339	445
Large and medium-sized mammals	38	42
Small mammals	17	38
Bats	28	112
Total number of vascular plant and vertebrate species	**>1354**	**>3215**

Geology, water, and soils

The Acarai-Corentyne Corridor comprises ancient landforms developed on a bedrock of igneous and metamorphic rock ranging from 1.2 to 3.4 billion years old. Erosion has formed a series of at least five stacked erosion surfaces in our study area. The two oldest, in the south, are the highest and least extensive. The plateau that covers 70% of the corridor corresponds to the 10 million year-old (My) Kuyuwini Surface, underlain by granitic bedrock ~2 billion years old. It drops off steeply to the west into the Rewa River valley and steeply to the north onto the much younger Rupununi (2 My) and Mazaruni surfaces.

Our first two camps were located on the Kuyuwini Surface. The hills at both sites are brownish loamy soils with moderate root mat and no bedrock. Lower elevations near the streams and rivers have white-clay soils that may be alluvial deposits. The Amuku Mountains hilltop we sampled had laterite on top, consistent with the summit being part of an older erosion surface ~30 My old. All waters at these camps were very pure and slightly acidic.

Our third camp was on the New River in a large, complex set of rapids in braided channels, consistent with this being the transition at which the river drops down from the Kuyuwini Erosion Surface to the lower Rupununi Erosion Surface. The bedrock at our third camp was

Geology, water, and soils (continued)	especially ancient, part of the 3.1–3.4 billion year-old Kanuku Complex. Soils are similar to the other camps but richer as indicated by a near-absence of root mat and higher stream conductivities. Rocks are encountered everywhere, along rivers and in soils. The New and Barrington Brown rivers were very pure and slightly acidic. The rapids on the New and Barrington Brown rivers have a peculiar feature: a widespread conglomerate of pebbles and cobbles cemented together by manganese dioxide into solid rock. The conglomerate fills the gaps between boulders in the rapids much like construction concrete. The rapids, and therefore base level, may be stabilized and even built up over time by these conglomerates, rather than eroded down as is typically the case.
Vegetation and flora	Our team of western and Indigenous botanists described vegetation types, collected and photographed ~600 plant specimens, and carried out a quantitative survey of >1,000 upland trees. This was an extremely productive partnership, as Indigenous residents of the area possess deep knowledge of the regional flora that is a major asset for conservation. Satellite imagery, overflights, and field work indicate that ~80% of the Acarai-Corentyne Corridor is mature upland forest. Surveys in our two 1-ha tree plots suggest that these forests are compositionally more similar to Amazonian forests in northern Brazil than to Guyana's best-studied forests in the country's central and northern regions. Species more typical of central Guyana like mora (*Mora* spp.), greenheart (*Chlorocardium rodiei*), and balata (*Manilkara bidentata*) were absent at the sites we visited, but do occur in the low-elevation forests at the northern end of the corridor. The most common tree species in the upland forests we studied included *Eperua* spp., *Oenocarpus bacaba*, *Minquartia guianensis* (Fig. 6K), and *Bocoa viridiflora*. Nearly a quarter of all trees belonged to three very diverse genera: *Licania* (Chrysobalanaceae), *Eschweilera* (Lecythidaceae), and *Pouteria* (Sapotaceae). Our fieldwork took place ~6 months before peak flowering and fruiting season (May) and fertile material was extremely scarce. We recorded at least 600 of the >2000 vascular plant species expected to occur in the corridor. While the area we visited is floristically similar to Kanashen Amerindian Protected Area, our notable finds include at least two tree species collected for the first time in Guyana and four globally threatened species.
Fishes	Creeks and rivers in the Acarai-Corentyne Corridor appear healthy and show almost no signs of human intervention. We used a variety of methods, including Indigenous fish traps and poison vine (*Deguelia* cf. *chrysophylla*), gill, hand and cast nets, environmental DNA, and drag seines to sample rocky, turbulent rapids and quiet sandy beaches in the main river channels, small forest creeks that are seasonally flooded, and small forest pools in swamps and along dried-out creeks. Large predatory fishes such as the wolf fish (*Hoplias aimara*) were abundant and concentrated in the remaining water bodies. In the rivers all fishes seemed to be in excellent physical condition; for example, the black piranhas (*Serrasalmus rhombeus*) were particularly large, with the largest individual weighing >2 kg. We also caught important food fishes, the banana catfish (*Phractocephalus hemioliopterus*; Fig. 7S), tiger catfish (*Pseudoplatystoma cf. reticulatum*; Fig. 7P), and peacock bass (*Cichla temensis*), as well as a very large and beautifully patterned freshwater stingray (*Potamotrygon boesemani*; Figs. 7A, 11J) and potentially dangerous electric eels (*Electrophorus electricus*).

	We recorded a total of 234 species of fishes in 42 families: 185 species from the middle and upper Essequibo sites and 72 from the upper Corentyne River basin, with just 42 species in common. Fifty-five fish species were only detected using eDNA. We found 22 species that are expected to be new records for Guyana. Previous surveys in the northwest corner of the study area suggest that the middle and upper Essequibo River fish communities are very different; with only 45 shared species of 185 total. We recorded 33 potential new species of fishes, pending confirmation with further morphological and genetic analysis. The Acarai-Corentyne Corridor harbors at least 40 fish species not currently protected by Guyana's protected areas system, as their distributions in Guyana are restricted to the Corentyne watershed.
Amphibians and reptiles	The eastern lowlands of the Guiana Shield harbor a rich and singular herpetofauna within Amazonia. Southeastern Guyana has been very little explored for this group and lies between distinct areas within these lowlands in terms of frog species composition. Previous inventories conducted nearby include one in the Kanuku Mountains, two in the Acarai Mountains (Guyana and Brazil), and additional inventories in nearby Suriname, along with older and scattered data from Kanashen Amerindian Protected Area and the New River. We conducted diurnal and nocturnal visual and acoustic encounter surveys to document the herpetofauna of the Acarai-Corentyne Corridor. We recorded 47 amphibian species, 45 squamates (lizards and snakes), four turtles, and two crocodilians. The recorded diversity is relatively high for reptiles but low for amphibians, mainly because of the extremely dry conditions during the sampling. Both groups were represented by typical communities for undisturbed upland forests of the Guiana Shield lowlands. One frog (*Anomaloglossus* sp.; Fig. 8F) and one lizard (*Arthrosaura* cf. *reticulata*; Fig. 8S) are potentially new to science, and six species are new for Guyana: the frogs *Chiasmocleis haddadi* (Fig. 8G), *Rhinella lescurei* (Fig. 8B), *Pristimantis grandoculis*, *Leptodactylus fremitus,* and *Pipa aspera* (eDNA), and the lizard *Arthrosaura kockii*. Some of the recorded species and probably some genetic lineages within them (candidate species) have a high proportion of their range within the Acarai-Corentyne Corridor, notably the two possibly new species. We also confirmed the meeting of distinct frog bioregions in this area of southern Guyana, by recording at least six species distributed in Suriname, French Guiana, and Amapá and six distributed in northern Brazil. We also recorded at least 13 species that are seemingly absent in the northern half of Guyana. Finally, two of the recorded species are considered to be globally Vulnerable—the turtles *Chelonoidis denticulata* (Fig. 8Q) and *Podocnemis unifilis*.
Birds	The bird team recorded 339 species at the three camps (15.5 days) and during three days of river travel. At each camp, we split into two groups to cover different sections of the trail network. Our goal was to be out from the start of the dawn chorus (~05:10) until the early afternoon, documenting anything unusual with photos and audio recordings. Most of our efforts were spent in mature upland rainforest but we also sampled seasonally flooded forest, stunted pole forest, palm swamps, second-growth forests with dense vine tangles, and aquatic habitat along the major rivers.

Birds (continued)	Overall, we found a hyperdiverse community of birds representative of the Guianan area of endemism. Although only a single scientific inventory has previously examined birds within the corridor, a handful of regional surveys have collectively found 431 species. We added 14 species to this tally, projecting a preliminary total of 445 species for the corridor (>50% of Guyana's bird diversity). One of these additions—the Speckled Spinetail (*Thripophaga gutturata*; Fig. 9D)—is a first country record for Guyana, while another, the Pelzeln's Tody-Tyrant (*Hemitriccus inornatus*), has only recently been found in white sand forest around Iwokrama and elsewhere. We also provide some of the first documentation for Black-whiskered Vireo (*Vireo altiloquus*; Fig. 9L) in Guyana. Other highlights include an astounding three observations of the rare, large eagles: one Harpy (*Harpia harpyja*; Fig. 9E) and two Crested Eagles (*Morphnus guianensis*; Figs. 9A, 9F), including both species in a single morning! The globally Vulnerable Harpy Eagle was one of two threatened birds we detected, while the Crested Eagle was one of four Near Threatened birds. We also found apparently plentiful populations of important game birds, which indicate very low to nonexistent hunting pressure and opportunities for sustainable, low-impact hunting.
Large and medium-sized mammals, and bats	We utilized four methods to survey the mammal community of the Acarai-Corentyne Corridor. For medium- and large-bodied species we set camera traps at 131 locations and conducted 120 km of transect walks over the 3-week survey period. For bats, 10 bat acoustic recorders totaled ~300 hours of audio recordings, and 10 mist-nets were opened for two nights per camp. For all methods, representative distribution of habitat, trail type, and resource proximity were considered in placement and data collection. The eDNA work allowed us to record small mammals that were not the focus of the other sampling methods. Field work yielded 83 of the 192 mammal species projected to occur in the corridor (38 medium- and large-bodied species, 17 small mammals, and 28 bats). The majority of the recorded species were registered in the >57,000 camera trap photos and videos, and in transect surveys and opportunistic encounters. Our species list represents a complete Neotropical mammal community inclusive of apex predators, seed dispersers, pest-control, pollinators, and ecosystem engineers that provide critical ecosystem services supporting forest health. Furthermore, this list contains the largest, most enigmatic mammal species found in the Amazon and Guiana Shield, including 10 species considered globally threatened, 24 CITES-regulated species, and 25 species protected in-country by the Guyana Wildlife Conservation and Management Commission. Some highlights are the frequent encounters we had with white-lipped peccaries (*Tayassu pecari*; Fig.10DD) and red-faced black spider monkeys (*Ateles paniscus*; Fig.10K), both important food sources for local people, as well as landscape engineers and seed dispersers, respectively. Top predators were also recorded, ranging from jaguar (*Panthera onca*; Fig.10Y) to the woolly false vampire bat (*Chrotopterus auritus*; Fig.10W).
Environmental DNA	Environmental DNA (eDNA) is DNA shed by organisms into the environment, often in the form of skin, hair, excrement, or mucus. eDNA aggregates in water bodies which are filtered to capture cells and free-floating DNA. Once collected, the DNA is extracted, amplified,

	sequenced, and assigned to a species. No visual or auditory detection is required; this is a sensitive, non-invasive sampling method that does not require specialized taxonomic knowledge for sample collection. During the inventory 97 aquatic eDNA samples were collected from the three camps and two major watersheds. Tributaries, puddles, swamps, and large rivers were sampled for DNA from the vertebrate species that inhabit these habitats and surrounding areas. A subset of filters were sequenced at the University of Guyana immediately after field work; we finished processing the remainder at the Field Museum four months later. A total of 306 vertebrate taxa were detected by eDNA: 221 species and 85 other taxa at lower taxonomic levels. Detected taxa included 155 fishes, 22 amphibians, eight reptiles, 51 birds, and 70 mammals. Ninety of these species were not detected by any other method, one species of frog is a new record for Guyana (*Pipa aspera*), and eight of the detected species are globally threatened.
Local ecological knowledge	Indigenous communities surrounding the Acarai-Corentyne Corridor possess a detailed and comprehensive array of ecological knowledge. This knowledge is based on direct observation of nonhuman species and in traditional practices and stories handed down through the generations. Local experts from three communities (Masakeñarî, Parabara, and Cashew Island) participated in biological research activities with all taxa groups, providing invaluable information regarding ecosystem dynamics and complexities. Far more than a set of details instrumentalizing the landscape, local ecological knowledge (LEK) describes a holistic and integrated way of knowing and moving through the environment. Ethnographic interviews and guided walks along trails yielded evidence of many different kinds of LEK, including the Indigenous names for nonhuman organisms; categories for describing ecological dynamics including seasonality and species distributions; keen observations of normal and anomalous animal behavior; stories about interspecies interactions; and the identification of nearly 100 species useful to humans as sources of food, medicine, shelter, and tools. Using insights from LEK, local experts can describe and trace the cascading effects of connections in the web of relationships between organisms across plants, aquatic species, and all terrestrial vertebrate taxa. Furthermore, Indigenous categories for describing and comparing habitat types—from mature upland forest (Waiwai: *comota*; Wapishana: *inawaz*; Trio: *itu*) to various kinds of seasonally-flooded forests and swamps—are evidence of sophisticated cognitive abstractions that allow for deep understanding of ecosystem changes over both space and time. The Indigenous names for places and landscape features also encode a wealth of knowledge that can refer to sites where useful species can be found. Traditional fishing strategies such as vine-based poisons and plaited fish trap baskets demonstrate the practical applications of LEK and the importance of maintaining this knowledge for future generations. The success of our expedition was thanks in large part to the knowledge preserved by local ecological experts, who understand the rivers and forests of the Acarai-Corentyne Corridor better than anyone else. LEK is a profoundly important asset for conservation in this region.

Social landscape

The Acarai-Corentyne Corridor is a richly social landscape in which well-known routes along trails, creeks, and rivers connect nearly a dozen Indigenous villages located outside the Corridor. Across vast distances in southern Guyana, northern Brazil, and southern Suriname, these dispersed Indigenous villages are bound together through shared kinship, history, and the contemporary travels through which these ties are substantiated. Current residents of the Indigenous villages located just southwest and northeast of the Corridor—Masakeñarî, Parabara, and Cashew Island—possess a living memory of the missionization period (1950s–1970s), which shifted Indigenous settlement and movement patterns. Waiwai, Wapishana, and Trio migrations in the latter half of the 20th century are tied to religious conversion and expanding transnational networks of familial relations and obligations. To the northwest, Apoteri and other Makushi villages have their own histories of connection to the northern portion of the Corridor. Indigenous place-names documented for landscape features—including creeks, rivers, rapids, mountains, trails, farms, hunting and fishing areas, and historical village sites—further evidence how the Acarai-Corentyne Corridor is thoroughly steeped in cultural and historical significance.

Though less well understood than other areas of the Guiana Shield, archaeological evidence suggests that Indigenous populations have moved through and created settlements in the region since at least 5,000 years ago. Despite European colonization along the Caribbean coast and in the Amazon basin causing both direct impacts (e.g., population decline due to diseases and violence) and indirect impacts (e.g., migration, access to trade goods via intermediaries), our team noted abundant evidence of a deep history of human habitation along the upper Essequibo and New rivers. Collaborative landscape and watershed mapping exercises revealed old village and farm sites as well as many new records of petroglyphs and grooves for sharpening stone tools, which occur in large densities and over wide expanses of the study area. In addition to corroborating Indigenous oral history that stretches back to the early 20th century, contemporary social connectivity across the Acarai-Corentyne Corridor offers an important asset for this landscape's conservation future.

Current status

All of the Acarai-Corentyne Corridor is currently part of the State Forest Estate, administered by the Guyana Forestry Commission. Most Forest Estate lands in southern Guyana are unallocated, meaning they have not historically been granted as forestry concessions. Exploratory forestry permits granted below the 4th parallel have been relinquished to continue the national policy position to allow these forests' contributions to conservation. As a result, these forests remain almost entirely unlogged and their timber stocks largely unsurveyed. Guyana's Forests Act (2009) and Protected Areas Act (2011) describe pathways for formal designation of state forests for the purposes of conservation and other uses.

In 2002–2012 Conservation International-Guyana operated a conservation concession in a ~40,000-ha area in the northwestern Acarai-Corentyne Corridor; this concession has since reverted to the state (Fig. 2A). A small number of mining and prospecting concessions issued by the Guyana Geology and Mines Commission (GGMC) also occur in the area. While no large-scale mining appears to have taken place in the corridor, we observed evidence of small-scale prospecting along the upper Essequibo River. Satellite data and oral anecdotes suggest mounting pressures from the southern borders of the corridor.

	The Guyana Defence Force operates a military post, Camp Jaguar, just outside the northeastern corner of the corridor. While there are no formal Indigenous land claims in the corridor, two Indigenous villages just outside the area do not currently possess title as provided in the Amerindian Act (2006): Cashew Island (Kasuela), which is in the New River, and Parabara, which lies to the west of the Essequibo River and is slated to receive title imminently (Department of Public Information 2025).
Principal assets for conservation	**01** Intact and healthy ecosystems, both terrestrial and aquatic, supporting globally important biodiversity and valuable ecosystem services. **02** Robust local knowledge of the forests and rivers among nearby Indigenous communities. This knowledge can support engaged and adaptive management of the area, and is being carefully preserved and transmitted from one generation to the next. **03** Headwaters of four of Guyana's principal rivers, an irreplaceable source of pure freshwater for the nation. **04** An overlap of multiple bioregions in the forests of southern Guyana, making the region a unique zone of biotic transition from the Guiana Shield to the Amazon Basin. **05** The remoteness of the area, due to physical boundaries such as mountains and waterfalls, keeping human pressures on the landscape relatively low.
Principal threats	**01** Legal and illegal mining for gold and other minerals, which can destroy forests and aquatic habitats and result in the long-term poisoning of food and water resources. **02** Erosion of ecological knowledge among local Indigenous communities, including loss of language, which would be compounded by any future restrictions in access to significant sites in the region that are important for cultural transmission. **03** Distance, potential distrust, and cultural barriers separating decision-makers in Georgetown from the Indigenous villagers who know this landscape best. **04** Climate change, whose impact is poorly understood in southern Guyana but which may result in higher temperatures, longer dry seasons, and potential habitat conversion. **05** Uncertainty caused by geopolitical disputes between Guyana, Suriname, and Venezuela.
Principal recommendations	**01** Take quick action to protect the forests and rivers of the Acarai-Corentyne Corridor from principal threats, supported by a task force that includes relevant government agencies, surrounding Indigenous communities, NGOs, and other stakeholders. **02** Ensure that benefits flowing from conservation are shared broadly and equitably with neighboring Indigenous communities, including continued access to the region for traditional activities. **03** Embrace local ecological knowledge in all future research activities, with a focus on how community knowledge can be integrated into evidence-based management strategies throughout the region. **04** Explore sustainable financial pathways that provide permanent support for the management, monitoring, and evaluation of any new conserved area and adjacent areas.

Why the Acarai-Corentyne Corridor?

High in the Acarai Mountains along Guyana's southern border, a rainstorm races across the canopy. Every drop of pelting rain will eventually end up in the Atlantic Ocean, on Guyana's northern coast, following one of two distinct routes. Some trickles will feed the headwater creeks and tributaries of Guyana's largest river, the Essequibo, while others will find their way into the headwaters of the equally majestic New River. For 400 sinuous kilometers, these two rivers run parallel to each other, tumbling over rapids and waterfalls, on their separate paths to the ocean.

Between them lies the Acarai-Corentyne Corridor, a 1.5 million-hectare wilderness stretching 275 km from the south, where it borders Brazil, to the north, where it borders Suriname. Along the way, this remote and isolated landscape descends nearly 800 m, giving way to a vast, unbroken expanse of rainforest and a spectacular diversity of plants and animals—millions of towering trees, enormous food fishes, and prowling apex predators. Throughout the landscape, ancient petroglyphs inscribe a complex history of human habitation, and a deep well of local knowledge persists in the Waiwai, Wapishana, Trio, and Macushi peoples in nearby Indigenous communities.

Administered for decades by the Guyana Forestry Commission, the corridor has remained remarkably intact, aside from a scattering of mining concessions. Were that mining to spread as it has across the continent, it would be calamitous for the headwater creeks that nourish Guyana's great rivers. Warding off this threat is paramount to stewarding the corridor's pristine headwaters into the future.

We envision an Acarai-Corentyne Corridor that advances Guyana's national biodiversity and development goals, anchors the world's largest remaining expanse of tropical forest, sustains clean drinking water and immense stores of carbon—where Guyana's largest vertebrates flourish and where deep, local knowledge is parlayed to safeguard and manage this national treasure, elevating Guyana's southern wilderness into the realm of Kaieteur Falls, Iwokrama Rainforest, and the Rupununi Savanna.

FIG.1 A spectacularly wild rainforest harboring whitewater rapids, mountains, petroglyphs, and a deep history of Indigenous ecological knowledge, Guyana's Acarai-Corentyne Corridor is one of the most important conservation opportunities in South America.

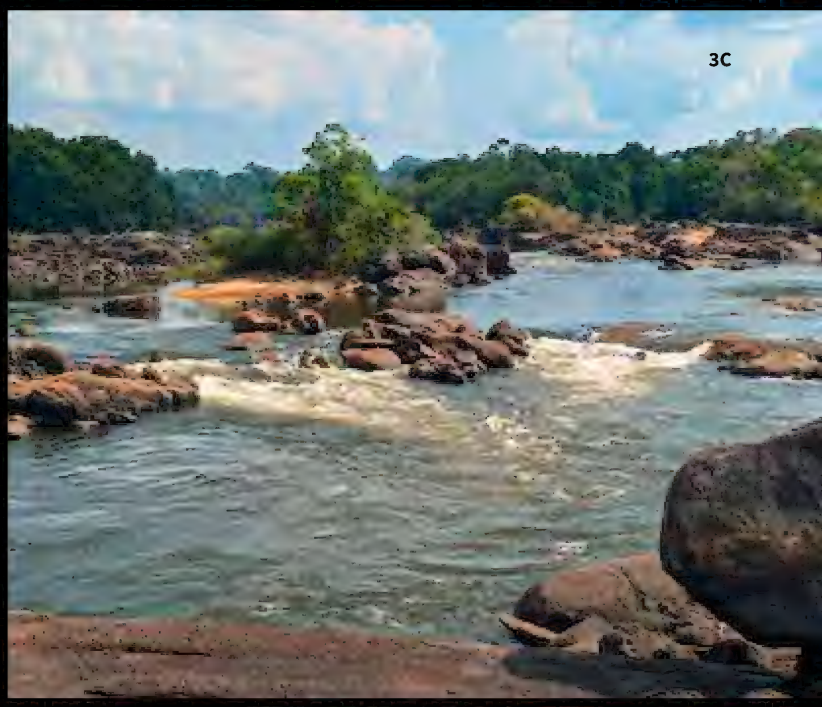
Int'l border
Acarai-Corentyne Corridor
Village
Landing strip
Protected area
Rapid or fall
Bare rock or inselberg
Campsites
C1: Camp Amuku
S1: Satellite C1
C2: Camp Monkey Jump
S2: Satellite C2
C3: Camp New River
50m
475m
900 m
Iwokrama Rainforest
2A
Apoteri
Annai
Rewa
Crash Water
Yakarinta
Essequibo River
Berbice River
Corentyne River
Tiger Falls
Aritapu or Lord Stanleys Falls
Cocoa Creek
SURINAME
ACARAI-CORENTYNE CORRIDOR
Kanuku Mountains Protected Area
Smyths Creek
Murray's Fall
Manarowa Great Fall
Rewa River
King George V Falls
King William IV Falls
Essequibo River
Jacob's Ladder
Great Falls
C3
Camp Jaguar
Ité Fall
Orosî Falls (Andira Falls)
Cashew Island (Kasuela)
Karamtu Falls
Paranakarî Falls
Chakana Falls (Kingfisher Falls)
King Edward VI Falls
Barrington Brown River
Corentyne River
King Edward River
New River
Oronoque Fall
GUYANA
Shea
Maruranau
Awarewaunau
Ité Fall
Consideration Fall
Nut Fall
Great Falls
Kwitaro River
East Rewa
Awarballi River
Karawaimen Taawa Mountain
Kuyuwini River
Saturday Rapids
Parabara
C2
S2
Kunurima Falls (Bubamana Fall)
Monkey Jump Creek
Yawanapi Falls
C1
Wiira Mountain
Kamoa Mountain
Katurima Mountain
Kassikaityu River
Amacî Falls
S1
Amuku Mountains
Kanashen Amerindian Protected Area
Xîpîrî Falls (Biloku Rapids)
Akî Falls
Gunns Strip
Kamoa Mountains
Masakeñarî
Itabu Creek
BRAZIL
0
12.5
25
50 km
N
VENEZUELA
GUYANA
COLOMBIA
PERU
BRAZIL

Guyana: Acarai-Corentyne Corridor

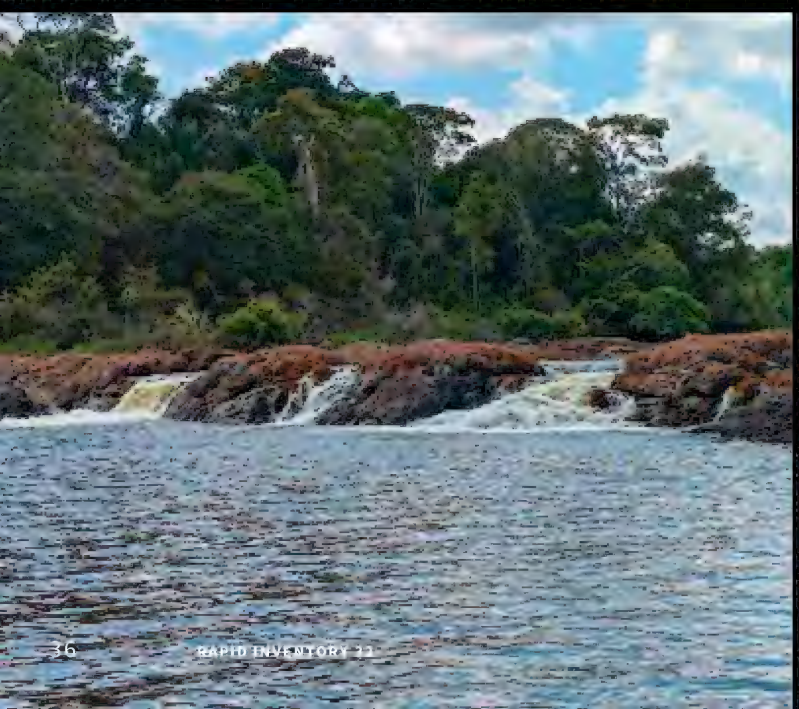
FIG. 2A Bounded by Guyana's largest rivers—the Essequibo to the west and the New and Corentyne to the east—the Acarai-Corentyne Corridor stretches more than half the length of Guyana. Dozens of rapids and waterfalls along the major rivers make this one of the least accessible and most poorly explored regions of the country. A vast plateau of low hills between 200 and 300 m elevation dominates the corridor, stretching from the base of the Acarai Mountains in the south to the lower coastal plain in the north.

2B Lying at the heart of southern Guyana's vast forests, the Acarai-Corentyne Corridor has the potential to anchor a mosaic of conservation lands that preserve biodiversity, uphold Indigenous land rights, and deliver real benefits to all Guyanese. To the south the corridor borders Kanashen Amerindian Protected Area and Brazil's largest protected area. Just outside its borders, Waiwai, Wapishana, Trio, and Macushi residents who have been exploring and using these forests for millennia hold deep and invaluable stores of knowledge about the landscape and its biodiversity.

3B



3C



3E

FIG. 3A The predominant feature of the Acarai-Corentyne Corridor, seen here from above our first campsite, is an unbroken expanse of forests and rivers that stretches to the horizon in every direction.

3B–E Just as Guyana is the Land of Many Waters, the Acarai-Corentyne Corridor is the Land of Many Rapids. The Essequibo (3A, C, E–G), New (3B, D), and Corentyne rivers tumble over hundreds of rapids and waterfalls on their way to the Atlantic Ocean.

3F Four of Guyana's most important rivers—the Essequibo, New, Corentyne, and Berbice—have their headwaters in the Acarai-Corentyne Corridor. Annually, rainfall in this region of Guyana generates more than 11 cubic kilometers of freshwater to Guyana's rivers—the equivalent of 4 million Olympic swimming pools. Water level in this stretch of the Essequibo fluctuates 11 m between the dry, low-water season (September–December) and the wet, high-water season.

3G Massive granite boulders along the Essequibo and New rivers testify to the ancient, 2 billion year-old Guiana Shield bedrock that underlies the corridor.

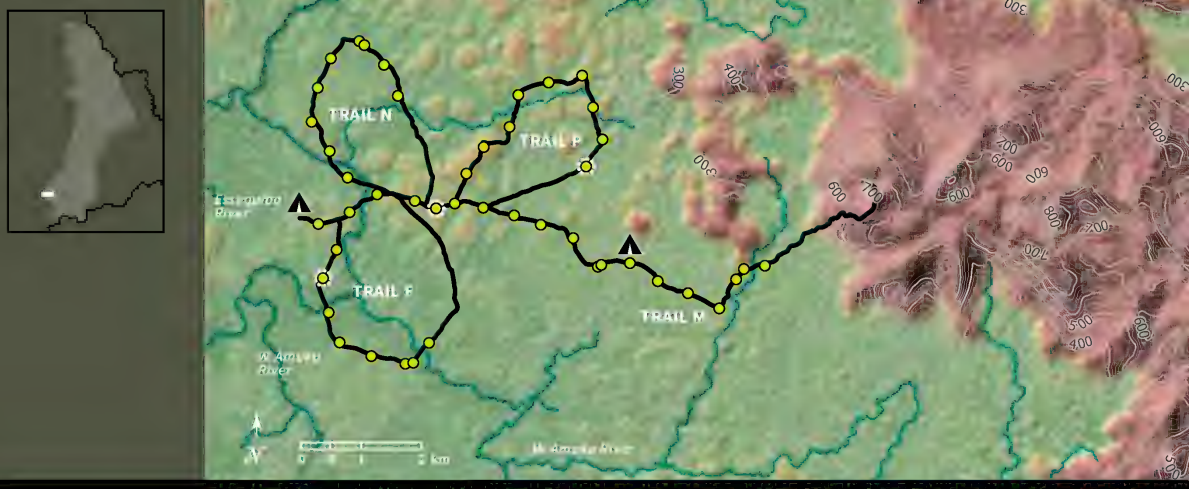
4A Eighty people from across Guyana and around the world took part in the rapid inventory. We were an interdisciplinary team of biologists, social scientists, and geologists from six Guyanese and seven international institutions, as well as 50 local experts from three nearby Indigenous villages.

4B–D Over 20 days we visited three sites spanning a broad range of forest and aquatic habitats in the Acarai-Corentyne Corridor.

Campsites
Trails
Bat Audio Recorder
Camera Traps

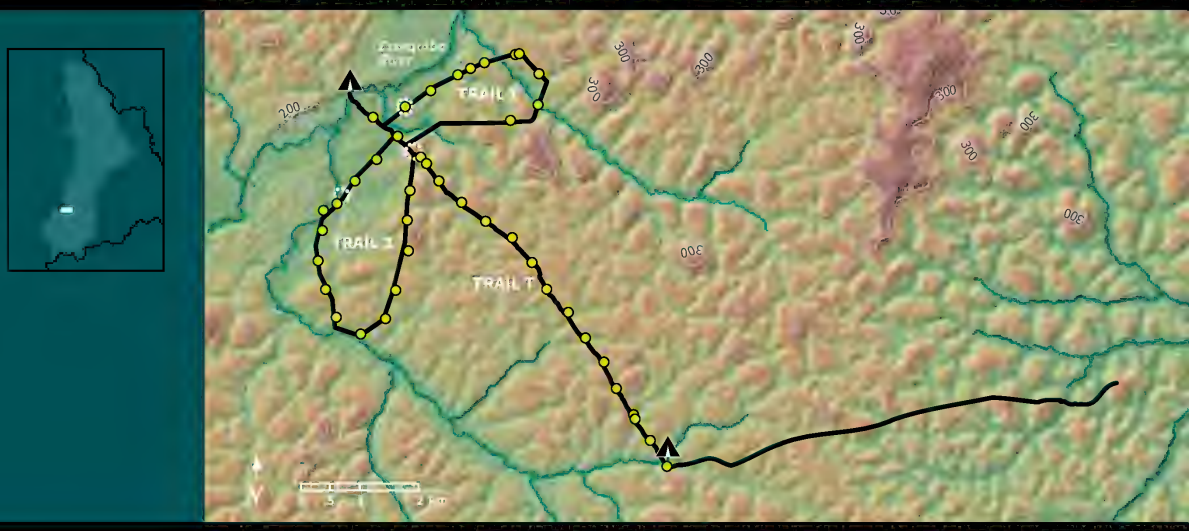
C1: CAMP AMUKU

Our first camp was on the eastern bank of the Essequibo River, where we sampled lowland forests around camp as well as a 700-m peak in the nearby Amuku Mountains (visible on the horizon in Fig. 4B).



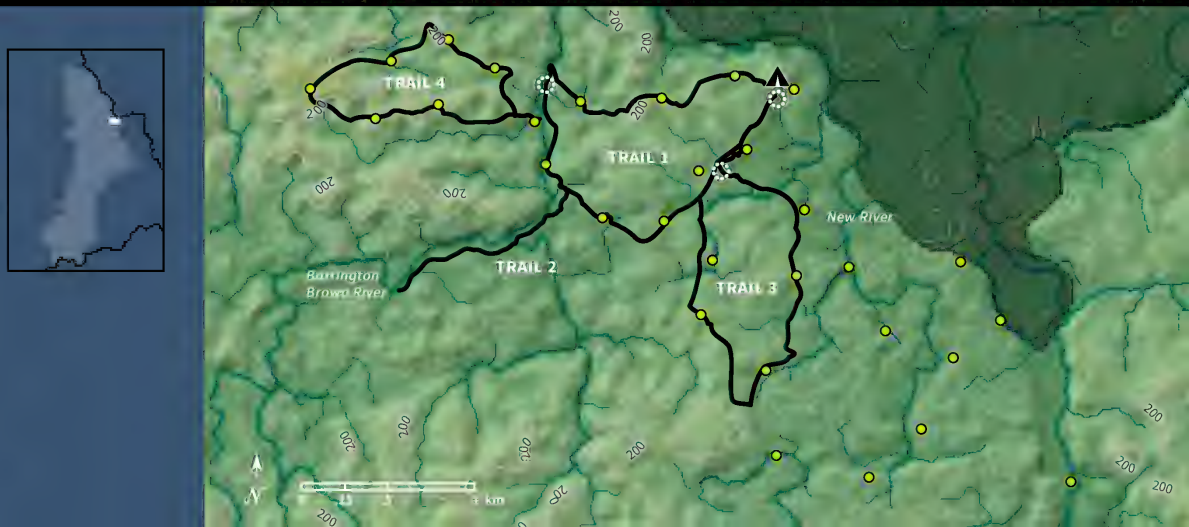
C2: CAMP MONKEY JUMP

Our second camp was a day's travel down the Essequibo, near the mouth of Monkey Jump Creek. A 17-km trail crossed the low divide between the Essequibo and New River watersheds, allowing us to sample both.

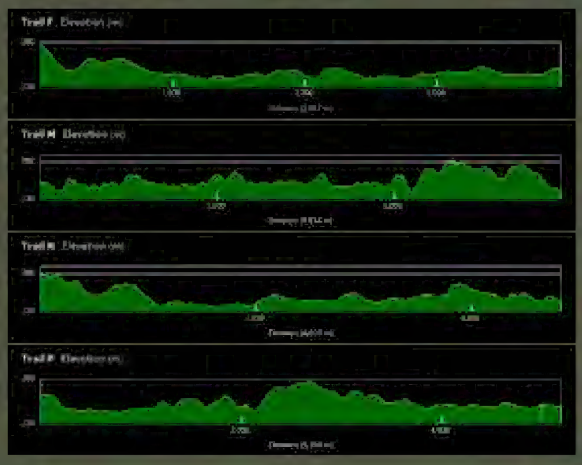


C3: CAMP NEW RIVER

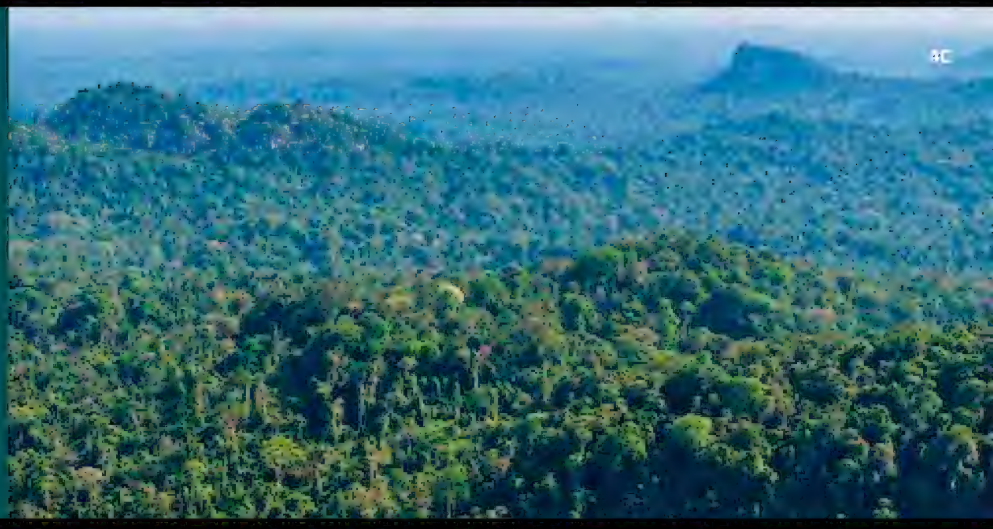
Our third camp was on the western bank of the New River, where it splinters into a braided channel of rapids and islands just before meeting the Corentyne River at the Guyana-Suriname border.



4A


Trail F Elevation (m)
Trail M Elevation (m)
Trail N Elevation (m)
Trail P Elevation (m)

Trail 1 Elevation (m)
Trail 2 Elevation (m)
Trail 7 Elevation (m)



4C

Trail 1 Elevation (m)
Trail 3 Elevation (m)
Trail 4 Elevation (m)

4D

Fig. 5A Geologist Bob Stallard surveyed the soils, waters, and surface geology of this ancient landscape.

5B The corridor is dominated by a plateau of rolling hills whose 2 billion year-old bedrock, illustrated here by granite boulders along the Essequibo, is covered by 10 million year-old soils.

5C Deep, reddish brown loamy soils are common throughout the uplands of the corridor.

5D Whitish clay soils have formed in the floodplains along the major rivers.

5E–F The complex surface geology of the corridor—and metamorphosed rocks like these along the Essequibo—bear witness to billions of years' worth of faulting, shearing, melting, folding, and weathering on the Guiana Shield, which boasts some of the most ancient rocks on Earth.

5G–K Where the New and Essequibo rivers encounter ledges in the underlying bedrock they form rapids, waterfalls, and complex braided channels punctuated by whirlpools and whitewater. On typical rivers, these rapids would erode the bedrock over millions of years. On the New River, however, these rapids appear to be stable or even increasing in elevation, due to the formation of a unique conglomerate that cements loose rocks together.

5E

5F

5G

5H

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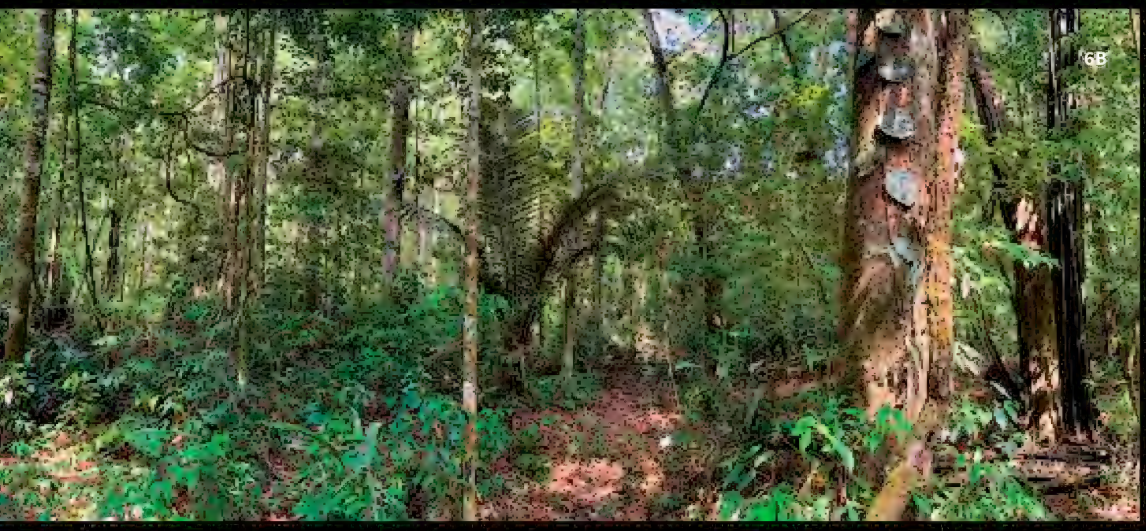


FIG. 6 Dominated by mature, never-logged forest, the Acarai-Corentyne Corridor is home to more than 800 million trees large enough to sling a hammock from.

6A More than 80% of the corridor is hyperdiverse upland forest that grades from a more Amazonian composition in the south to one more similar to Iwokrama Rainforest in the north.

6B Low-lying areas covering 5–10% of the corridor harbor seasonal swamp forest where the açaí palm (*Euterpe oleracea*) plays a central role.

6C Mature riparian forest borders the major rivers, accounting for another 5–10% of the landscape.

6D Younger forests tangled in vines—apparently the result of riparian disturbance—occupy the remainder of the landscape.

6E–S The botanical team recorded several hundred species of an estimated flora of >2000.

6E A diverse aquatic flora, including *Mourera fluviatilis*, thrives in the region's many rapids.

6F–G, K, R Extrapolations from our tree surveys suggest that several million towering emergent trees—many more than 50 m tall—stand guard in the corridor.

6H *Prionostemma aspera*

6J *Aechmea rubiginosa*

6K *Minquartia guianensis*

6L The deep and intact botanical knowledge in nearby Indigenous communities, like that of Waiwai plant expert James Suse, represents a major asset for science, for Guyana, and for the corridor.

6M In addition to Indigenous plant experts, our team included Kaslyn Holder-Collins of the University of Guyana and two international experts.

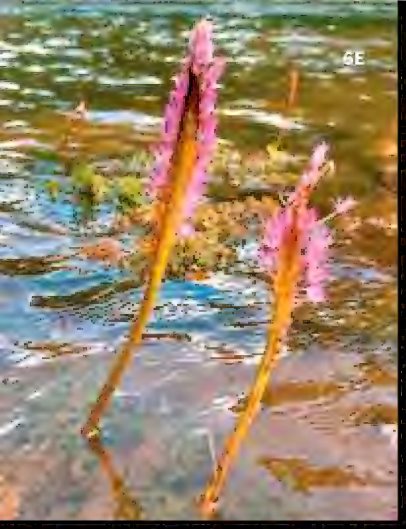
6N *Dioclea* sp.

6P Freshwater sponges (*Drulia* sp.), exposed by the low water levels, dotted the forest along the Essequibo River.

6Q We visited at the height of the dry season, when flowers and fruits were scarce. The only place we encountered a large number of plants in flower—like this *Paloue* sp.—was along the banks of the New River.

6R *Bertholletia excelsa*, Brazil nut

6S Hundreds of other plant photos taken in the Acarai-Corentyne Corridor can be viewed on iNaturalist.org.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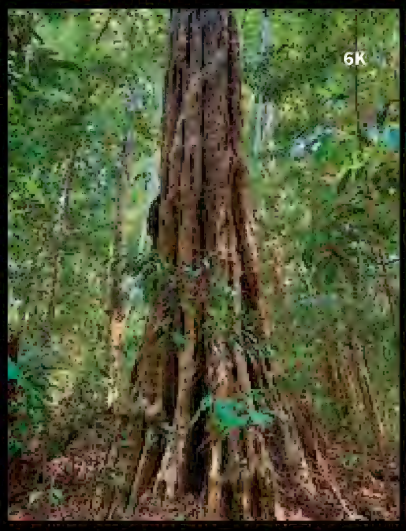
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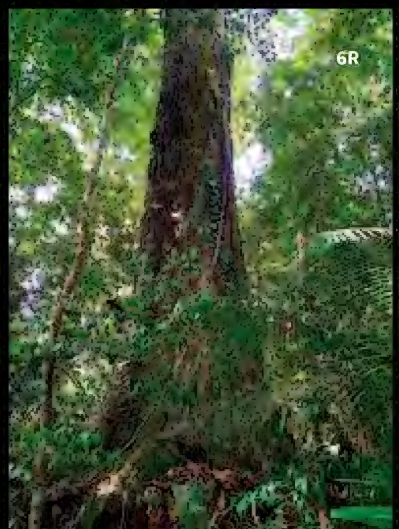
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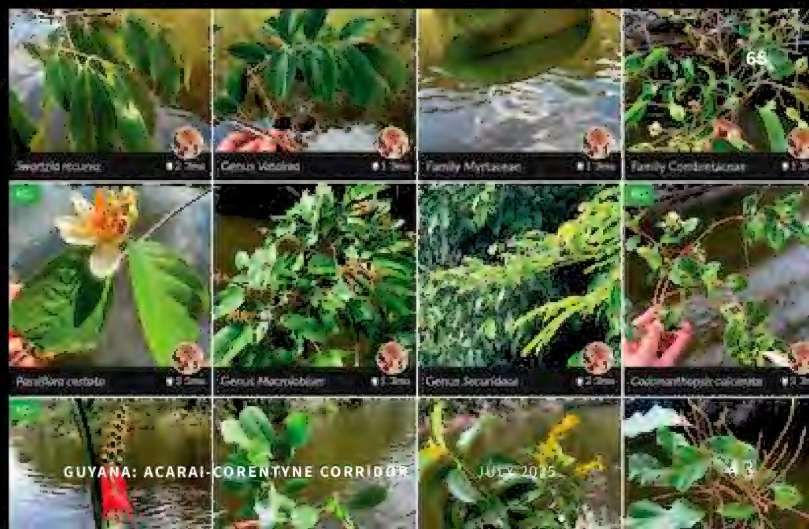

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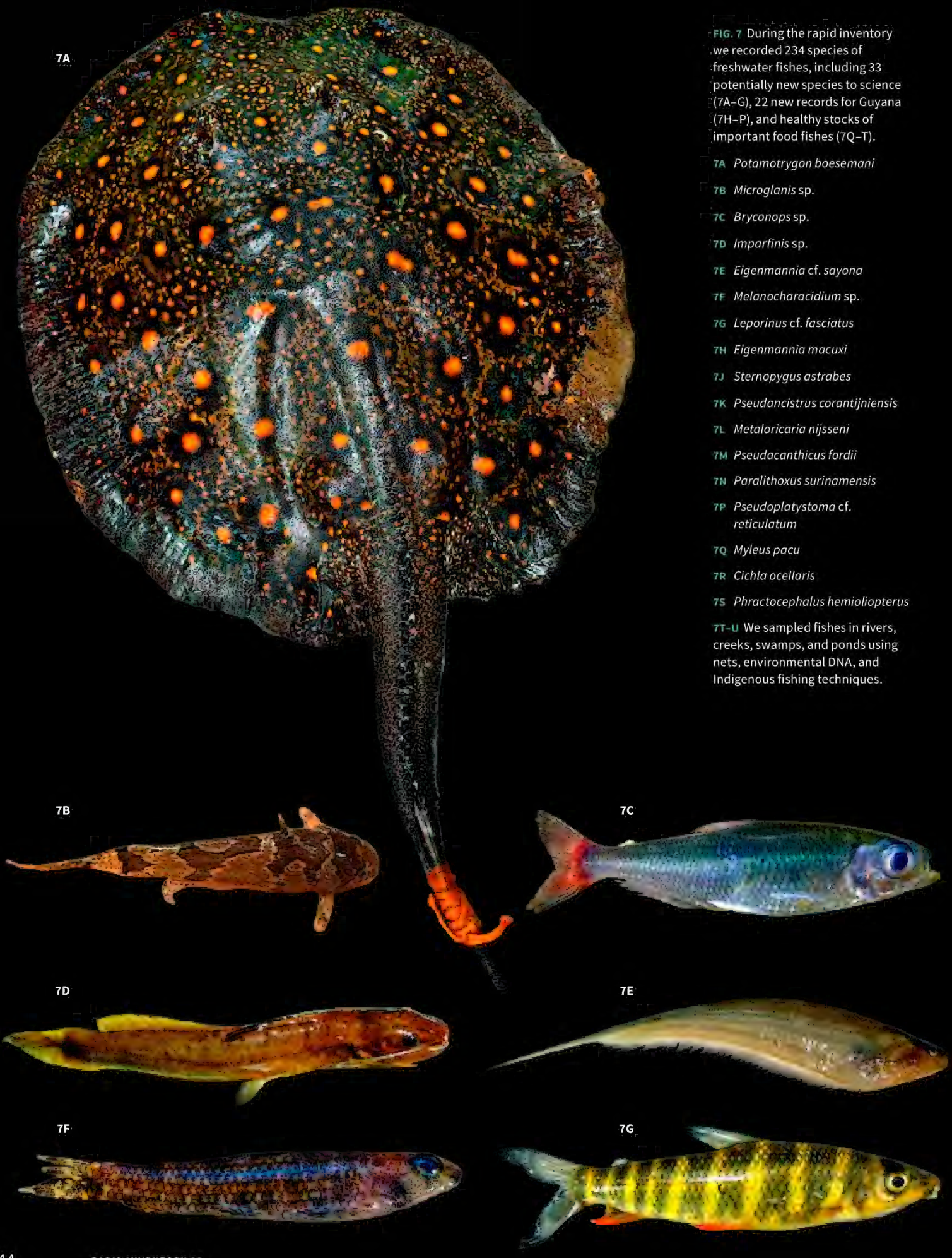

FIG. 7 During the rapid inventory we recorded 234 species of freshwater fishes, including 33 potentially new species to science (7A–G), 22 new records for Guyana (7H–P), and healthy stocks of important food fishes (7Q–T).

7A *Potamotrygon boesemani*

7B *Microglanis* sp.

7C *Bryconops* sp.

7D *Imparfinis* sp.

7E *Eigenmannia* cf. *sayona*

7F *Melanocharacidium* sp.

7G *Leporinus* cf. *fasciatus*

7H *Eigenmannia macuxi*

7J *Sternopygus astrabes*

7K *Pseudancistrus corantijniensis*

7L *Metaloricaria nijsseni*

7M *Pseudacanthicus fordii*

7N *Paralithoxus surinamensis*

7P *Pseudoplatystoma* cf. *reticulatum*

7Q *Myleus pacu*

7R *Cichla ocellaris*

7S *Phractocephalus hemioliopterus*

7T–U We sampled fishes in rivers, creeks, swamps, and ponds using nets, environmental DNA, and Indigenous fishing techniques.

7H
7J
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7P
7T
7Q
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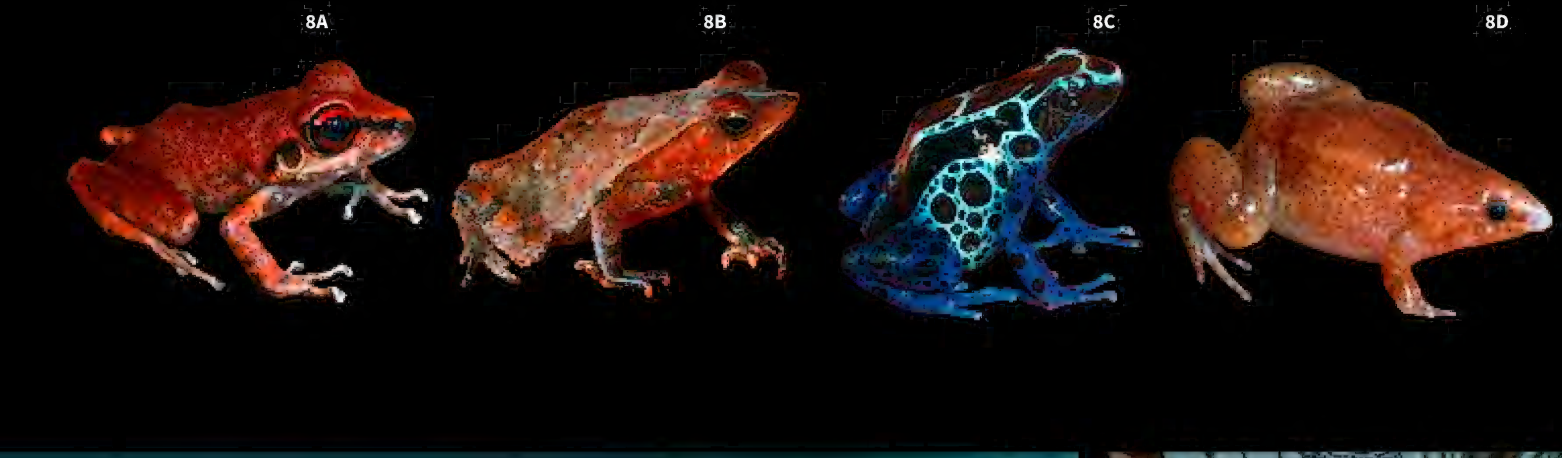
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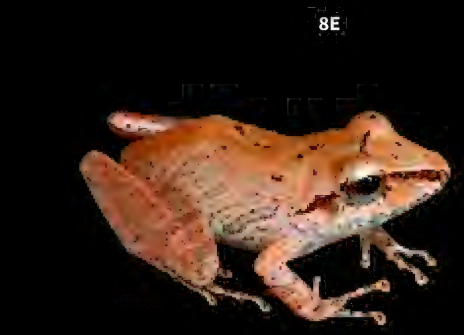
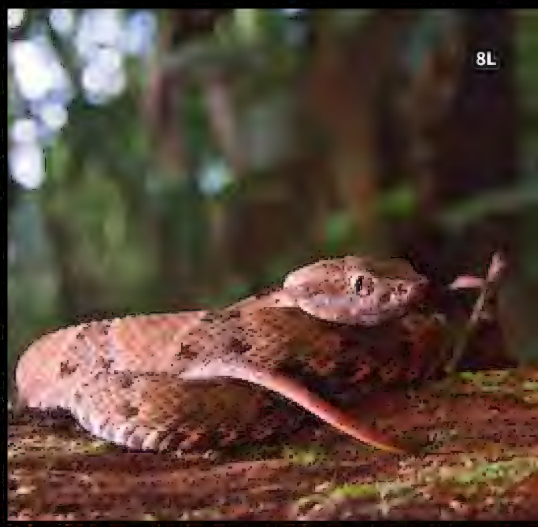




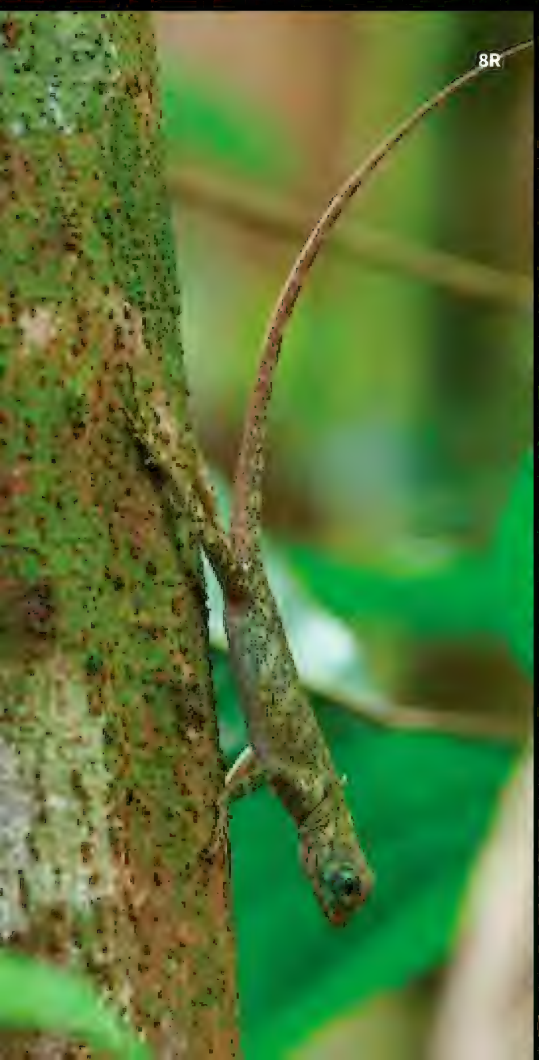


FIG. 8 Over 17 days we recorded 47 species of amphibians and 51 species of reptiles, including 10 species that are globally threatened, new records for Guyana, or potentially new to science.

8A *Pristimantis zeuctotylus*

8B *Rhinella lescurei*, new to Guyana

8C *Dendrobates tinctorius*

8D *Synapturanus mirandaribeiroi*

8E *Pristimantis koehleri*

8F *Anomaloglossus* sp., potentially new to science

8G *Chiasmocleis haddadi*, new to Guyana

8H Additional sampling will likely yield a total of ~90 amphibian and ~90 reptile species.

8J *Oxyrhopus petolarius*

8K *Dendrophidion dendrophis*

8L *Bothrops atrox*

8M *Chironius multiventris*

8N *Epictia tenella*

8P *Caiman crocodilus*

8Q *Chelonoidis denticulata*, globally Vulnerable

8R *Plica umbra*

8S *Arthrosaura* cf. *reticulata*, potentially new to science

9A

9B

9C

9D

9E

9F

9G

FIG. 9 We detected 339 species of birds that, alongside a half-dozen regional surveys, projects a total of ~450 species—more than half of Guyana's bird diversity.

9A Crested Eagle (*Morphnus guianensis*)

9B Male Band-tailed Antshrike (*Thamnophilus melanothorax*)

9C Female Band-tailed Antshrike (*Thamnophilus melanothorax*)

9D Nest of a Speckled Spinetail (*Thripophaga gutturata*), a new species for Guyana

9E Harpy Eagle (*Harpia harpyja*)

9F Crested Eagle (*Morphnus guianensis*)

9G For the first time, autonomous recording units featured prominently in our sampling design.

9H Gray-winged Trumpeter (*Psophia crepitans*)

9J Ferruginous-backed Antbird (*Myrmoderus ferrugineus*)

9K Common Scale-backed Antbird (*Willisornis poecilinotus*)

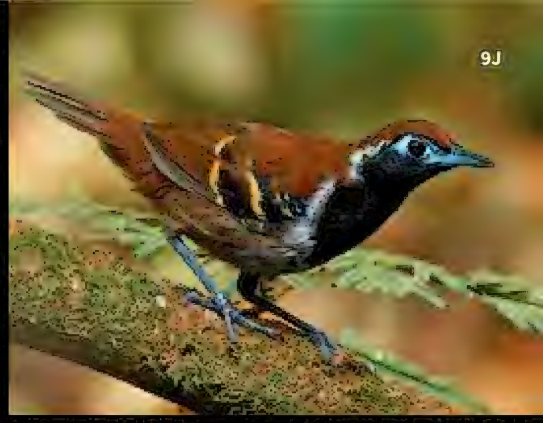
9L Black-whiskered Vireo (*Vireo altiloquus*)

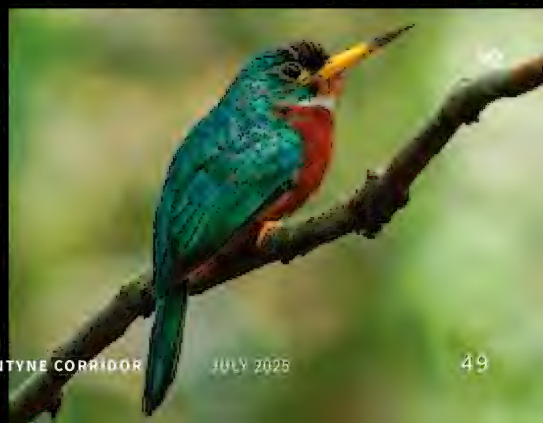
9M Asaph Wilson co-led the bird surveys.

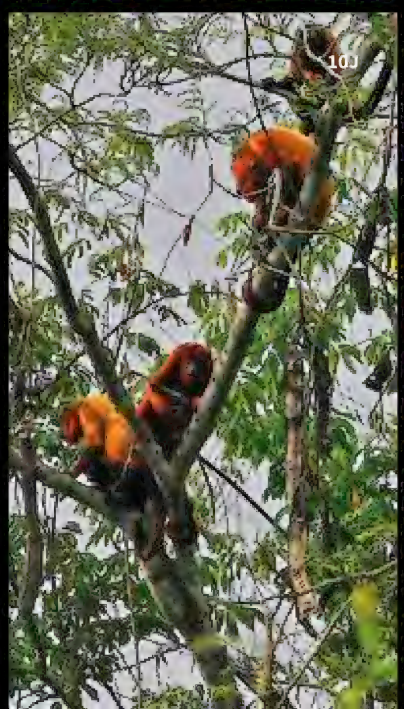
9N *Marail Guan (Penelope marail)*

9P Yellow-throated Woodpecker (*Piculus flavigula*)

9Q Yellow-billed Jacamar (*Galbula albirostris*)







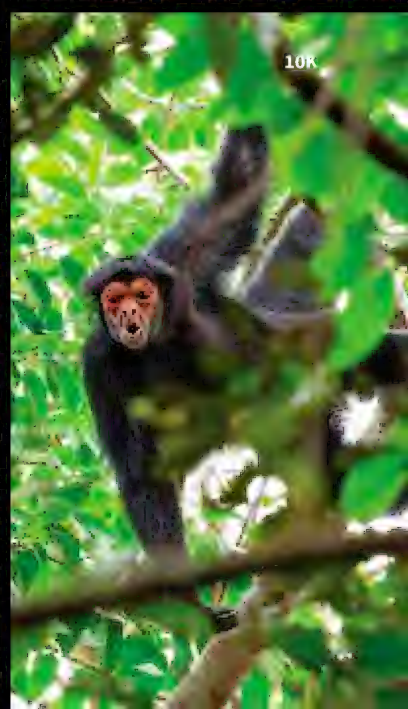


FIG. 10 The Acarai-Corentyne Corridor harbors one of the most diverse mammal communities on Earth. Our team of outside and Indigenous experts used trail surveys (10A), camera traps (10B), mist nets (10U), audio recorders, environmental DNA, and opportunistic encounters to record as many mammals as we could. The inventory yielded 83 of the 192 species expected to occur in the corridor, including all eight of Guyana's primate species, 10 globally threatened species, and 25 species protected in-country by the Guyana Wildlife Conservation and Management Commission. Local Indigenous communities possess deep knowledge of the behavior, abundance, and distribution of mammals on the landscape. We documented Waiwai, Wapishana, and Trio names for nearly all of the species we recorded (Appendix 7).

10C *Marmosops* sp.

10D *Didelphis marsupialis*

10E *Dicotyles tajacu*

10F *Dasypus guianensis*

10G *Bradypus tridactylus*

10H *Eira barbara,* a leucistic individual

10J *Alouatta macconnelli*

10K *Ateles paniscus,* globally Vulnerable

10L *Saimiri sciureus*

10M *Cebus olivaceus*

10N *Myoprocta acouchy*

10P *Cuniculus paca*

10Q *Priodontes maximus,* globally Vulnerable

10R *Lophostoma silvicola*

10S *Rhynchonycteris naso*

10T Stenodermatinae sp.

10V *Pteronotus parnellii*

10W *Chrotopterus auritus*

10X *Leopardus wiedii*

10Y *Panthera onca*

10Z *Leopardus pardalis*

10AA *Pteronura brasiliensis,* globally Endangered

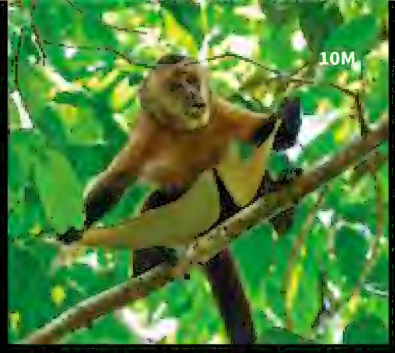
10BB *Nasua nasua*

10CC *Tapirus terrestris,* globally Vulnerable

10DD *Tayassu pecari,* globally Vulnerable

10EE *Mazama americana*

10L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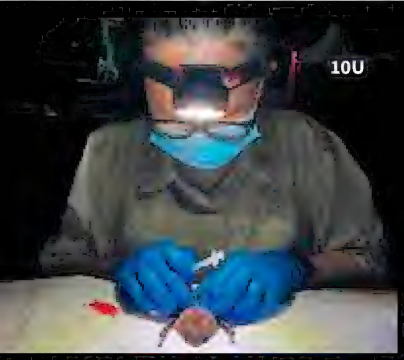
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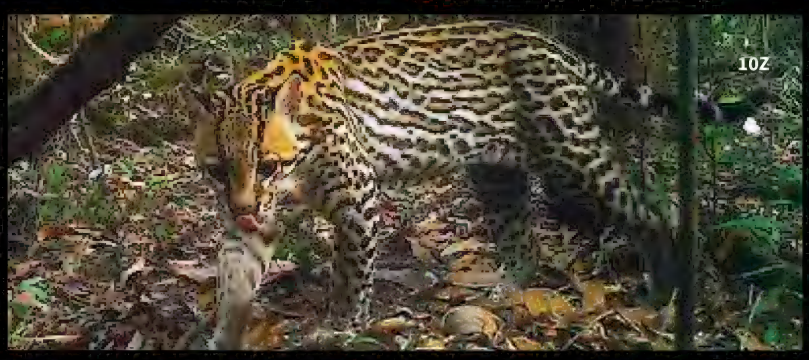
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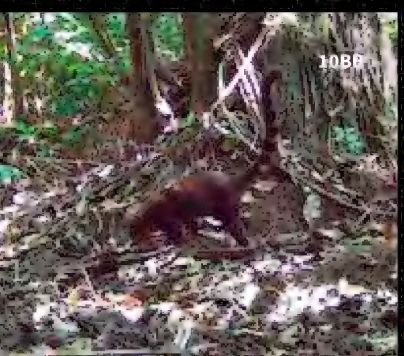
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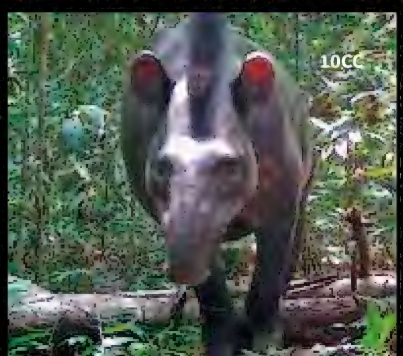
10CC

10DD

10EE

FIG.11 Nearby Indigenous communities maintain robust local ecological knowledge about the Acarai-Corentyne Corridor, an important cultural asset for community well-being, including sustainable use practices like hunting and fishing. Local expertise also strengthened biological data collection during the rapid inventory.

11A The local ecological knowledge team documented detailed understanding of connections between species through dialogues on topics like seasonality.

11B Kwang Suse and Asaph Wilson brought knowledge from nearby forests to the bird team.

11C Local experts classify forest habitat types and notice old farm areas from social memory or the vegetation composition.

11D An Indigenous fishing technique using the *Deguelia chrysophylla* vine yielded 40% of the total fish specimens collected in the inventory.

11E–F Local experts like Tina Kenke know where to procure the vine and where it is best used. Cultural norms shape decision-making about frequency of use and sharing the catch.

11G Pounding the vine releases a juice whose compounds immobilize fish through vasoconstriction.

11H Masakeñarî experts readying for a day on the trail system.

11J Local experts possess detailed knowledge about the different fish communities of each watershed, like this stingray collected in a New River tributary.

11K Connecting Indigenous and Linnean species names helps convey local knowledge to visitors.

11L Richard Andrew reviewing Wapishana species names with Jeremy Campbell.

11M Phillip Suse identifying giant anteater scratch marks.

11N Local experts evaluate upland forest soils when selecting farm sites.

11P–Q Detailed local knowledge of aquatic ecologies helped procure different fish specimens, as Mark Suse (11P) and Syra Ayaw (11Q) demonstrate.

11R Isaiah Ayaw preparing bait for a Waiwai *kamina* fish trap. The fish trap design was seen on petroglyphs in the area.

11J

11K

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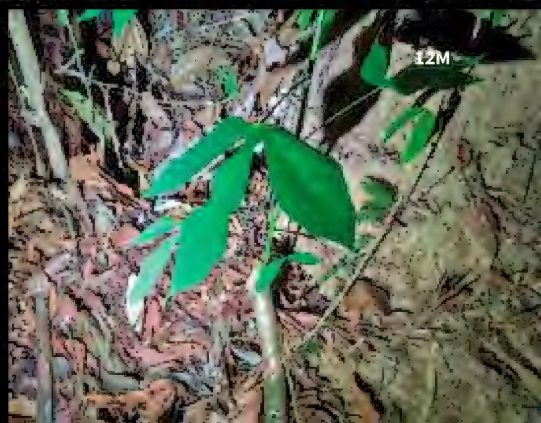
12M

FIG.12 The vast forests of the Acarai-Corentyne Corridor are a social landscape. Well-traveled river routes and trails connecting Waiwai, Wapishana, and Trio Indigenous peoples living nearby show the area's cultural value, as do abundant petroglyphs. Local experts who know these rivers and forests best are important assets for the Corridor's conservation future.

12A Traversing falls on river journeys requires skill and experience.

12B Indigenous trails connecting the Essequibo and New rivers date back generations.

12C Syra Ayaw traces a glyph at Tipa.

12D Anthropogenic figure at Kunurima Falls.

12E Tikkil Kenke interprets a glyph at Orosî Falls.

12F Primate figure at Kunurima Falls.

12G Tina Kenke feels for a glyph's contour at Orosî Falls.

12H–J Grinding surfaces evidence deep human history, where stone tools were sharpened in the past.

12K–L Participatory mapping at each camp revealed the extent of Indigenous mobility.

12M Wild *manihot* on the New River suggests past human occupation.

13A–D In addition to traditional sampling methods, we inventoried vertebrates via the emerging tool of environmental DNA (eDNA). Water samples taken at 97 different locations during the inventory were subsequently analyzed in labs at the University of Georgetown and the Field Museum and the genetic sequences in the samples identified to species. 221 species of vertebrates were recorded via eDNA, and 90 of them by no other method.

FIG. 14 With one of the least-disturbed rainforests on Earth, Guyana aims to achieve global conservation goals in a way that benefits all Guyanese.

14A–C The rapid inventory reflected Guyana's commitment to engage diverse conservation stakeholders: discussing findings with local residents in the field (14A); synthesizing results in a Georgetown workshop to share immediately with policymakers (14B); and coordinating closely with Indigenous leaders (14C).

14D–F The team showcased the Acarai-Corentyne Corridor in Georgetown just a week after leaving the field, including Protected Areas Commission speakers Robert Persaud (14D), Fitzroy Sealey (14E), and Damian Fernandes (14F).

Conservation Targets

01 **A vast ecological corridor of intact, mature, undisturbed rainforests and rivers** extending 250 km from the Brazil-Guyana border in the south to the Suriname-Guyana border in the north, free of roads and other human infrastructure. Bordered on every side by equally intact wilderness, the Acarai-Corentyne Corridor lies at the heart of the world's largest remaining expanse of tropical forest, which comprises much of Brazil north of the Amazon as well as French Guiana, Suriname, Guyana, and Venezuela. Starting at the border of the Acarai-Corentyne Corridor, one can travel hundreds of kilometers in every direction before encountering a significant break in forest cover: 455 km to the south (the Amazon River), 725 km to the east (the Atlantic Ocean), 200 km to the north (the intermediate savannas), and 100 km to the west (the Rupununi savannas). Intact forest landscapes like the Acarai-Corentyne Corridor are increasingly rare at the global scale and have an exceptional value *per se*, as well as huge value for biodiversity, ecosystem services, and Indigenous peoples (Potapov et al. 2008, Watson et al. 2018).

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02 **The headwaters of Guyana's two largest rivers—the Essequibo and Corentyne**—and their capacity for generating huge volumes of freshwater. Based on drainage area, we estimate the Acarai-Corentyne Corridor to contribute 144 m^3 of freshwater per second to the total discharge of the Essequibo River and 214 m^3 of freshwater per second to the total discharge of the Corentyne River. This totals 4.5 and 6.7 billion m^3 of freshwater per year, respectively. The Acarai-Corentyne Corridor accounts for ~3% of the total Essequibo watershed, ~14% of the total Corentyne watershed (including the New and Barrington Brown watersheds), and ~44% of the total New River watershed. The northern tip of the corridor generates freshwater for a fourth important Guyanese river—the Berbice.

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03 **A landscape mosaic harboring vast expanses of different terrestrial and aquatic habitats.** Spanning an elevational gradient from 73 to 873 m above sea level, the Acarai-Corentyne Corridor offers high habitat diversity, from tiny headwater streams and scrub forests in the highest reaches of the Acarai Mountains to giant meandering rivers and towering rainforests in the lowlands.

- **A diverse array of terrestrial habitats and vegetation types:**
  - an immense block of upland forest shaded by nearly a billion large trees that provide habitat for the lion's share of the area's biodiversity
  - seasonally flooded riparian forests along the major rivers, creeks, and lakes
  - seasonally wet swamp forest along hundreds of kilometers' worth of creeks within the upland forest matrix
  - small patches of unique vegetation associated with exposed rock inselbergs
  - small patches of stunted 'pole' forests on unusual soil types
  - small patches dominated by single species (*Guadua bamboo, Euterpe oleracea* and *Mauritia flexuosa* palms)
  - small patches of unique plant communities associated with the ever-wet spray zone around large waterfalls on the Essequibo and New rivers
- **A diverse array of freshwater aquatic habitats:**
  - clean and unpolluted waterways across more than 900 km of four of Guyana's largest rivers (the Essequibo, New, Corentyne, and Berbice)
  - ~10 major tributaries of these large rivers, some of which are enormous in their own right (e.g., the Barrington Brown River measures >50 m wide and its watershed spans >125,000 ha)
  - hundreds of rocky headwater streams high in the Acarai and Amuku mountains
  - thousands of kilometers' worth of upland and montane creeks draining the landscape
  - dozens of major waterfalls and rapids on the Essequibo and New rivers
  - large stretches of the New and Essequibo rivers with complex braided courses, where the large river splinters into as many as 20 separate streams as it passes over geological barriers
  - a small number of lakes along the Essequibo, in the northernmost portion of the corridor
  - hundreds of rapids, waterfalls, river islands, sandbars, and mudflats that are underwater for a portion of the year and exposed during the dry season
  - extensive patches of unique aquatic plant communities associated with rapids

- upland and floodplain streams that flow for a portion of the year and vanish in the dry season
- caves and subterranean streams in the Acarai and Amuku mountains

04 **Ecological functions and ecosystem services free from significant human impacts.** The Acarai-Corentyne Corridor harbors some of the last fully intact ecological networks on Earth, where seed dispersal and pollination, nutrient cycling, predator-prey dynamics and trophic interactions, natural ecological succession, freshwater provision, air and water purification, and flood and erosion attenuation operate as they have for thousands of years, as reflected by indicators such as:

- enormous stocks of above- and belowground carbon in the region's standing forests
- healthy floodplain forests that mitigate floods and keep erosion to a minimum
- rivers and lakes that people use for drinking water and that serve as the primary means for travel between communities
- healthy populations of Guyana's largest terrestrial vertebrates, including jaguar, giant armadillo, giant anteater, lowland tapir, white-lipped peccary, and red-faced black spider monkey
- healthy populations of Guyana's largest aquatic vertebrates, including giant river otter, capybara, river turtles, catfish, electric eels, and anacondas
- healthy populations of avian apex predators (large eagles of the genera *Harpia* and *Morphnus*)
- a refuge for terrestrial and near-ground insectivorous birds, guilds for which there is some evidence that declines may be widespread, even in 'pristine' Amazonian rainforest
- large and healthy animals, including some of the largest fishes our experts had ever seen

05 **Local Indigenous residents' multi-faceted and holistic knowledge of the landscape and its biodiversity.** The Acarai-Corentyne Corridor maintains important cultural values, as reflected by indicators such as:

- game and fish species taken as food (see lists below)
- wild and cultivated plants used for food: cassava (*Manihot esculenta*), Brazil nut (*Bertholletia excelsa*; Fig. 6R), cashew (*Anacardium* spp.), açaí (*Euterpe oleracea*), ité (*Mauritia flexuosa*), peach palm (*Bactris gasipaes*), *kapidola* porridge vine, *koruma* berries, avocado (*Persea americana*), corn (*Zea mays*), and dozens of native plants whose fruits are collected for food
- plants used for tools and shelter: arrow cane, *umawa* vine for fishing (*Deguelia* cf. *chrysophylla*), *mîîna* or *maraya* palm for thatching, *macanari* tree bark for cordage, and *kukwa* (angelina; *Dinizia excelsa*), *kanawa*, and other hardwoods for making canoes and furniture
- historic farming and/or settlement sites that are part of oral histories or the archeological record
- petroglyphs and grinding surfaces, where the past sharpening of stone tools left smooth depressions in rocks
- Indigenous language names for hundreds of plant and animal species and dozens of landscape features, including rivers, mountains, swamps, and waterfalls
- Indigenous language classification systems for major forest types, and detailed characterizations of seasonal patterns in terrestrial and aquatic ecology

06 **Healthy populations of species that are under pressure** from fishing, hunting, logging, and the pet trade elsewhere in South America:

- **Healthy populations of large game birds** (tinamous, guans, curassows, and trumpeters) including:
  - Great Tinamou (*Tinamus major*)
  - Variegated Tinamou (*Crypturellus variegatus*)
  - Marail Guan (*Penelope marail*; Fig. 9N)
  - Black Curassow (*Crax alector*)
  - Marbled Wood-Quail (*Odontophorus gujanensis*)
  - Gray-winged Trumpeter (*Psophia crepitans*; Fig. 9H)
- **Healthy populations of game mammals**, including:
  - white-lipped peccary (*Tayassu peccari*; Fig. 10DD)
  - collared peccary (*Dicotyles tajacu*; Fig. 10E)
  - lowland or Brazilian tapir (*Tapirus terrestris*; Fig. 10CC)
  - red-faced black spider monkey (*Ateles paniscus*; Fig. 10K)
  - red howler monkey (*Alouatta macconnelli*; Fig. 10J)
  - lowland paca (*Cuniculus paca*; Fig. 10P)
  - giant anteater (*Myrmecophaga tridactyla*)
  - deer (*Mazama* spp.; Fig. 10EE)
  - armadillos (Figs. 10F, 10Q)

- **Healthy populations of large and commonly eaten fish species**, including:
  - black piranha (*Serrasalmus rhombeus*)
  - haimara or wolf fish (*Hoplias aimara*)
  - banana catfish (*Phractocephalus hemioliopterus*; Fig. 7S)
  - tiger catfish (*Pseudoplatystoma* cf. *reticulatum*; Fig. 7P)
  - peacock bass (*Cichla* cf. *ocellaris* and *C.* cf. *temensis*)
  - bocachico (*Prochilodus rubrotaeniatus*)
  - vampire fish (*Hydrolycus armatus*)
  - brycon (*Brycon falcatus*)
  - pacu (*Myleus pacu*; Fig. 7Q)
- **Healthy populations of bird, frog, and fish species that are valued as ornamentals or pets**, including:
  - *Ara* and *Orthopsittaca* macaws
  - parrots and parakeets of the genera *Brotogeris*, *Pionus*, *Amazona*, *Pionites*, *Deroptyus*, *Pyrrhura*, and *Psittacara*
  - blue poison frog (*Dendrobates tinctorius*; Fig. 8C)
  - current and potential ornamental fish species in the genera *Corydoras*, *Hoplisoma*, *Pseudacanthicus*, *Guianacara*, *Megalamphodus*, *Anostomus*, and *Moenkhausia*
- **Significant stands and volume of valuable timber species** (Polak 1992), including:
  - Brazilian teak (*Dipteryx odorata*)
  - *Cedrelinga cateniformis*
  - common baromalli (*Catostemma commune*)
  - crabwood (*Carapa guianensis*)
  - kabukalli (*Goupia glabra*)
  - karakalli (*Eschweilera* and *Lecythis* spp.)
  - kirikaua (*Iryanthera* spp.)
  - red angelim (*Dinizia excelsa*)
  - silverballi (*Ocotea* spp.)
  - wallaba (*Eperua* spp.)
  - multiple species of Chrysobalanaceae and Sapotaceae

  Additional hardwood species not observed during the rapid inventory but present in the northern lowlands of the corridor according to a forestry inventory carried out there (Environmental Management Consultants 2012):

  - bulletwood (*Manilkara bidentata*)
  - greenheart (*Chlorocardium rodiei*)
  - huruasa (*Abarema jupunba*)
  - limonaballi (*Chrysophyllum pomiferum*)
  - locust (*Hymenaea* sp.)
  - manni (*Symphonia globulifera*)
  - mora (*Mora excelsa* and *M. gonggrijpii*)
  - purpleheart (*Peltogyne* sp.)
  - shibadan (*Aspidosperma* sp.)
  - tatabu (*Diplotropis purpurea*)
  - tauroniro (*Humiria balsamifera*)
  - wamara (*Swartzia leiocalycina*)
  - washiba (*Tabebuia* sp.)

07 **A diverse and little-known flora and fauna** of immense scientific value:

- At least **35 species** recorded during the inventory that are **potentially new to science**:
  - **1 frog** in the genus *Anomaloglossus* (Fig. 8F)
  - **1 lizard** provisionally identified as *Arthrosaura* cf. *reticulata* (Fig. 8S)
  - **33 fishes:**
    - *Apistogramma* cf. *ortmanni*
    - *Brycon* cf. *pesu*
    - *Bryconops* sp. (redtail) (Fig. 7C)
    - *Chasmocranus* sp.
    - *Cichla* cf. *ocellaris* (Fig. 7R)
    - *Eigenmannia* cf. *macuxi* (Fig. 7H)
    - *Eigenmannia* cf. *sayona* (Fig. 7E)
    - *Eigenmannia* sp.
    - *Geophagus* cf. *surinamensis*
    - *Hemigrammus* cf. *elegans*
    - *Hemiodus* cf. *goeldii*
    - *Hemiodus* cf. *microlepis*
    - *Hemiodus* cf. *semitaeniatus*
    - *Hemiodus* cf. *ternetzi*
    - *Hemiodus* cf. *thayeria*
    - *Imparfinis* cf. *hasemani*
    - *Imparfinis* sp. (Fig. 7D)
    - *Krobia* cf. *guianensis*
    - *Laimosemion* cf. *mabura*
    - *Leporinus* cf. *fasciatus* (Fig. 7G)

- *Lugubria* cf. *lenticulata*
- *Lugubria* cf. *lugubris*
- *Lugubria* cf. *strigata*
- *Melanocharacidium* cf. *dispilomma*
- *Melanocharacidium* sp. (Fig. 7F)
- *Microglanis* sp. (Fig. 7B)
- *Moenkhausia* cf. *dichoura*
- *Moenkhausia* cf. *intermedia*
- *Moenkhausia* cf. *lepidura*
- *Paralithoxus* cf. *surinamensis* (Fig. 7N)
- *Pseudoplatystoma* cf. reticulatum (Fig. 7P)
- *Rineloricaria* sp.
- *Sternopygus* n sp.

- At least **31 species** recorded during the inventory that are **new records for Guyana**:
  - **1 bird:** Speckled Spinetail (*Thripophaga gutturata*; Fig. 9D)
  - **5 frogs:**
    - *Chiasmocleis haddadi* (Fig. 8G)
    - *Leptodactylus fremitus*
    - *Pipa aspera*
    - *Pristimantis grandoculis*
    - *Rhinella lescurei* (Fig. 8B)
  - **1 lizard:** *Arthrosaura kockii*
  - **22 fishes:**
    - *Bivibranchia bimaculata*
    - *Brachyhypopomus pinnicaudatus*
    - *Bryconops* sp. (redtail) (Fig. 7C)
    - *Eigenmannia* cf. *sayona*
    - *Eigenmannia* sp.
    - *Guianacara sphenozona*
    - *Hemigrammus elegans*
    - *Hoplisoma baderi*
    - *Hypostomus corantijni*
    - *Hypostomus pseudohemiurus*
    - *Leporinus apollo*
    - *Leporinus nijsseni*
    - *Metaloricaria nijsseni* (Fig. 7L)
    - *Moenkhausia* cf. *surinamensis*
    - *Moenkhausia grandisquamis*
    - *Paralithoxus surinamensis* (Fig. 7N)
    - *Pimelodella geryi*
    - *Potamotrygon boesemani* (Fig. 7A)
    - *Pseudacanthicus fordii* (Fig. 7M)
    - *Saxatilia sipaliwini*
    - *Sternopygus astrabes* (Fig. 7J)
    - *Sternopygus* n sp.
  - **2 trees:**
    - *Duguetia stelechantha*
    - *Schistostemon macrophyllus*

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08 **At least 22 plant and animal species considered globally threatened or near threatened** by the IUCN (2024):

- **10 mammals:**
  - giant river otter (*Pteronura brasiliensis*), Endangered (Fig. 10AA)
  - giant anteater (*Myrmecophaga tridactyla*), Vulnerable
  - giant armadillo (*Priodontes maximus*), Vulnerable (Fig. 10Q)
  - red-faced black spider monkey (*Ateles paniscus*), Vulnerable (Fig. 10K)
  - lowland or Brazilian tapir (*Tapirus terrestris*), Vulnerable (Fig. 10CC)
  - white-lipped peccary (*Tayassu pecari*), Vulnerable (Fig. 10DD)
  - bush dog (*Speothos venaticus*), Near Threatened
  - jaguar (*Panthera onca*), Near Threatened (Fig. 10Y)
  - margay (*Leopardus wiedii*), Near Threatened (Fig. 10X)
  - Neotropical otter (*Lontra longicaudis*), Near Threatened
- **6 birds:**
  - White-rumped Sandpiper (*Calidris fuscicollis*), Vulnerable
  - Harpy Eagle (*Harpia harpyja*), Vulnerable (Fig. 9E)
  - Semipalmated Sandpiper (*Calidris pusilla*), Near Threatened
  - Agami Heron (*Agamia agami*), Near Threatened

- Crested Eagle (*Morphnus guianensis*), Near Threatened (Figs. 9A, 9F)
- Ornate Hawk-Eagle (*Spizaetus ornatus*), Near Threatened

▪ 2 turtles:

- yellow-footed tortoise (*Chelonoidis denticulata*), Vulnerable (Fig.8Q)
- yellow-spotted river turtle (*Podocnemis unifilis*), Vulnerable

▪ 4 plants:

- sarabebeballi (*Vouacapoua americana*), Critically Endangered
- rosewood (*Aniba rosodora*), Endangered
- Brazil nut (*Bertholletia excelsa*), Vulnerable (Fig.6R)
- *Tabebuia insignis*, Near Threatened

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09 **At least 100 animal species whose trade is restricted** by the CITES Convention under Appendices I, II, or III (UNEP 2024):

▪ 24 mammals:

- giant river otter (*Pteronura brasiliensis*), Appendix I (Fig.10AA)
- ocelot (*Leopardus pardalis*), Appendix I (Fig.10Z)
- margay (*Leopardus wiedii*), Appendix I (Fig.10X)
- jaguar (*Panthera onca*), Appendix I (Fig.10Y)
- bush dog (*Speothos venaticus*), Appendix I
- Neotropical otter (*Lontra longicaudis*), Appendix I
- giant armadillo (*Priodontes maximus*), Appendix I (Fig.10Q)
- golden-handed tamarin (*Saguinus midas*), Appendix II
- brown capuchin (*Sapajus apella*), Appendix II
- wedge-capped capuchin (*Cebus olivaceus*), Appendix II (Fig.10M)
- Guianan squirrel monkey (*Saimiri sciureus*), Appendix II (Fig.10L)
- reddish-brown bearded saki (*Chiropotes sagulatus*), Appendix II
- white-faced saki (*Pithecia pithecia*), Appendix II
- red howler monkey (*Alouatta macconnelli*), Appendix II (Fig.10J)
- puma (*Puma concolor*), Appendix II
- jaguarundi (*Puma yagouaroundi*), Appendix II
- collared peccary (*Dicotyles tajacu*), Appendix II (Fig.10E)
- giant anteater (*Myrmecophaga tridactyla*), Appendix II
- red-faced black spider monkey (*Ateles paniscus*), Appendix II (Fig.10K)
- lowland or Brazilian tapir (*Tapirus terrestris*), Appendix II (Fig.10CC)
- white-lipped peccary (*Tayassu pecari*), Appendix II (Fig.10DD)
- lowland paca (*Cuniculus paca*), Appendix III (Fig.10P)
- tayra (*Eira barbara*), Appendix III (Fig.10H)
- kinkajou (*Potos flavus*), Appendix III

▪ 57 birds:

- hummingbirds (Trochilidae), hawks (Accipitridae), owls (Strigidae), toucans (Ramphastidae), falcons (Falconidae), and parrots (Psittacidae); see Appendix 6 for the full species list and CITES classification

▪ 4 frogs:

- brilliant-thighed poison frog (*Allobates femoralis*), Appendix II
- three-striped poison frog (*Ameerega trivittata*), Appendix II
- blue poison frog (*Dendrobates tinctorius*), Appendix II (Fig. 8C)
- Rita's glass frog (*Vitreorana ritae*), Appendix II

▪ 4 snakes:

- emerald tree boa (*Corallus caninus*), Appendix II
- Amazon tree boa (*Corallus hortulana*), Appendix II
- rainbow boa (*Epicrates cenchria*), Appendix II
- green anaconda (*Eunectes murinus*), Appendix II

▪ 1 lizard:

- golden tegu (*Tupinambis teguixin*), Appendix II

▪ 2 caimans:

- spectacled caiman (*Caiman crocodilus*), Appendix II (Fig. 8P)
- Schneider's dwarf caiman (*Paleosuchus trigonatus*), Appendix II

▪ 3 turtles:

- South American river turtle (*Podocnemis expansa*), Appendix II
- yellow-spotted river turtle (*Podocnemis unifilis*), Appendix II

- yellow-footed tortoise (*Chelonoidis denticulata*), Appendix II (Fig. 8Q)

▪ **11 plants:**

- *Dichaea ancoraelabia*, Appendix II
- *Dipteryx odorata*, Appendix II
- *Epidendrum rigidum*, Appendix II
- *Epiphyllum phyllanthus*, Appendix II
- *Prosthechea roraimensis*, Appendix II
- *Rhipsalis baccifera*, Appendix II
- *Scaphyglottis prolifera*, Appendix II
- *Stanhopea grandiflora*, Appendix II
- *Tabebuia insignis*, Appendix II
- *Vanilla pompona*, Appendix II
- *Wullschlaegelia calcarata*, Appendix II

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10 **At least 55 species officially managed or protected in Guyana** according to the Guyana Wildlife Conservation and Management Commission (GWCMC):

▪ **25 mammals:**

- giant river otter (*Pteronura brasiliensis*), Protected (Fig. 10AA)
- ocelot (*Leopardus pardalis*), Protected (Fig. 10Z)
- margay (*Leopardus wiedii*), Protected (Fig. 10X)
- jaguar (*Panthera onca*), Protected (Fig. 10Y)
- bush dog (*Speothos venaticus*), Protected
- Neotropical otter (*Lontra longicaudis*), Protected
- giant armadillo (*Priodontes maximus*), Protected (Fig. 10Q)
- puma (*Puma concolor*), Protected
- jaguarundi (*Puma yagouaroundi*), Protected
- giant anteater (*Myrmecophaga tridactyla*), Protected
- Guianan long-nosed armadillo (*Dasypus guianensis*), Managed (Fig. 10F)
- red brocket deer (*Mazama americana*), Managed (Fig. 10EE)
- great long-nosed armadillo (*Dasypus kappleri*), Managed
- pale-throated three-toed sloth (*Bradypus tridactylus*), Managed
- southern tamandua (*Tamandua tetradactyla*), Managed
- Brazilian porcupine (*Coendou prehensilis*), Managed
- capybara (*Hydrochoerus hydrochaeris*), Managed
- red-rumped agouti (*Dasyprocta leporina*), Managed (Fig. 10N)
- golden-handed tamarin (*Saguinus midas*), Managed
- brown capuchin (*Sapajus apella*), Managed
- wedge-capped capuchin (*Cebus olivaceus*), Managed (Fig. 10M)
- Guianan squirrel monkey (*Saimiri sciureus*), Managed (Fig. 10L)
- lowland or Brazilian tapir (*Tapirus terrestris*), Managed (Fig. 10CC)
- lowland paca (*Cuniculus paca*), Managed (Fig. 10P)
- kinkajou (*Potos flavus*), Managed

▪ **28 protected birds,** all closed for hunting during at least three months of the year:

- Crimson Topaz (*Topaza pella*), Vulnerable
- White-necked Jacobin (*Florisuga mellivora*), Vulnerable
- Rufous-breasted Hermit (*Glaucis hirsutus*), Vulnerable
- Pale-tailed Barbthroat (*Threnetes leucurus*), Vulnerable
- Straight-billed Hermit (*Phaethornis bourcieri*), Vulnerable
- Long-tailed Hermit (*Phaethornis superciliosus*), Vulnerable
- Reddish Hermit (*Phaethornis ruber*), Vulnerable
- Black-eared Fairy (*Heliothryx auritus*), Vulnerable
- Racket-tipped Thorntail (*Discosura longicaudus*), Vulnerable
- Gray-breasted Sabrewing (*Campylopterus largipennis*), Vulnerable
- Fork-tailed Woodnymph (*Thalurania furcata*), Vulnerable
- Rufous-throated Sapphire (*Hylocharis sapphirina*), Vulnerable
- King Vulture (*Sarcoramphus papa*), Vulnerable
- Black Vulture (*Coragyps atratus*), Vulnerable
- Greater Yellow-headed Vulture (*Cathartes melambrotus*), Vulnerable
- Black Hawk-Eagle (*Spizaetus tyrannus*), Vulnerable
- Ornate Hawk-Eagle (*Spizaetus ornatus*), Vulnerable
- Crested Eagle (*Morphnus guianensis*), Vulnerable (Figs. 9A, 9F)
- Harpy Eagle (*Harpia harpyja*), Vulnerable (Fig. 9E)

- Tawny-bellied Screech-Owl (*Megascops watsonii*), Vulnerable
- Crested Owl (*Lophostrix cristata*), Vulnerable
- Mottled Owl (*Strix virgata*), Vulnerable
- Black Nunbird (*Monasa atra*), Vulnerable
- Slaty-backed Forest-Falcon (*Micrastur mirandollei*), Vulnerable
- Barred Forest-Falcon (*Micrastur ruficollis*), Vulnerable
- Lined Forest-Falcon (*Micrastur gilvicollis*), Vulnerable
- Bat Falcon (*Falco rufigularis*), Vulnerable
- Scarlet Macaw (*Ara macao*), Vulnerable

▪ **1 turtle:**

- giant South American river turtle (*Podocnemis expansa*), Vulnerable

▪ **1 tree:**

- sarabebeballi (*Vouacapoua americana*), Critically Endangered

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11 **At least 9 species considered endemic to Guyana:**

▪ **9 fishes:**

- *Ancistrus lithurgicus*
- *Cetopsidium roae*
- *Hyphessobrycon minor*
- *Phenacogaster carteri*
- *Phenacogaster megalostictus*
- *Phenacogaster microstictus*
- *Pimelodella altipinnis*
- *Pimelodella leptosoma*
- *Pseudancistrus nigrescens*

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12 **At least 12 migratory species:**

▪ **12 boreal migrant birds** that spend only a portion of the year in Guyana:

- American Golden-Plover (*Pluvialis dominica*)
- Spotted Sandpiper (*Actitis macularius*)
- Solitary Sandpiper (*Tringa solitaria*)
- Greater Yellowlegs (*Tringa melanoleuca*)
- White-rumped Sandpiper (*Calidris fuscicollis*)
- Pectoral Sandpiper (*Calidris melanotos*)
- Semipalmated Sandpiper (*Calidris pusilla*)
- Osprey (*Pandion haliaetus*)
- Black-whiskered Vireo (*Vireo altiloquus*; Fig. 9L)
- Bank Swallow (*Riparia riparia*)
- Barn Swallow (*Hirundo rustica*)
- Northern Waterthrush (*Parkesia noveboracensis*)

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13 **A gorgeous landscape with high scenic value, abundant wildlife, and other attractions for ecotourism operations, such as:**

▪ visually stunning landscape features including braided rivers, rapids, inselbergs, waterfalls, and mountains

▪ significant populations of the 'Giants of Guyana' (giant armadillo, jaguar, giant anteater, giant river otter, capybara, lowland tapir, white-lipped peccary, red-faced black spider monkey)

▪ hyperdiverse community of birds, attractive to a global network of birders and photographers, including sought-after species like the rare Crested Eagle (*Morphnus guianensis*; Figs. 9A, 9F) and Harpy Eagle (*Harpia harpyja*; Fig. 9E), as well as range-restricted, Guianan endemics such as the Band-tailed Antshrike (*Thamnophilus melanothorax*; Figs. 9B–C)

Assets and opportunities for conservation

Guyana's Low-Carbon Development Strategy 2030 (LCDS) outlines actions the Government of Guyana will take to achieve its ambitious commitment to conserve 30% of terrestrial and marine areas by 2030 (Government of Guyana 2022). To make findings from the rapid inventory of the Acarai-Corentyne Corridor immediately available for policymakers, in late November 2024 members of the field team held a daylong synthesis workshop in Georgetown with 19 additional representatives of Guyanese government, academic, and non-governmental organizations, as well as representatives of the three Indigenous communities who participated in the research. Participants focused on building a shared understanding of the assets and opportunities for conservation specific to this area as well as known and emerging threats, with a view toward synthesizing these to broad recommendations for conservation action in the corridor.

1 **Advancing Guyana's national biodiversity and area creation commitments.** Establishing a new conservation area between the Essequibo and Corentyne Rivers directly supports Guyana's commitment to meeting international biodiversity goals, such as the Kunming-Montreal Global Biodiversity Framework (GBF) and the United Nations' Sustainable Development Goals (SDGs). The GBF, adopted in December 2022, includes a target to effectively conserve and manage at least 30% of the world's lands and waters by 2030. Guyana's Low Carbon Development Strategy aligns with this objective, aiming to increase terrestrial protected areas coverage from its current 8.4% to 30% by 2030 (UNEP-WCMC and IUCN 2025). Protection of the Acarai-Corentyne Corridor (which occupies 6.99% of Guyana's land surface) will also meet Guyana's commitment to doubling the size of its protected areas network by 2025.

2 **Protecting the headwaters of key river systems.** The proposed conservation area encompasses the headwaters of vital river systems, including the New River, Essequibo River, and the Berbice River. Protecting these headwaters is crucial for maintaining water quality and supporting the diverse ecosystems they nourish. The Essequibo River basin alone is home to over 300 fish species, with nearly 60 endemic species. Establishing this as the first protected area east of the Essequibo and within the Corentyne watershed will mark a significant milestone in preserving Guyana's rich aquatic biodiversity and ensuring the health of these critical waterways.

3 **Establishing collaborative management by and for local communities.** Empowering local communities to co-manage the conservation area ensures that traditional knowledge and sustainable practices are integrated into resource management. Kanashen Amerindian Protected Area serves as a successful example, where the Waiwai community sets, communicates and enforces management of their ancestral lands, balancing conservation with sustainable use. In the proposed area, collaborative management will enable sustainable harvesting of aquatic and terrestrial resources, preserving biodiversity while supporting community livelihoods. Local communities can work with the government to create enforcement procedures based on local ecological knowledge and customary practices. This approach fosters a sense of ownership and responsibility, leading to more effective and enduring conservation outcomes.

4 **Generating benefits that flow to local communities.** The establishment of a conservation area has the potential to bring numerous benefits to local communities, including job creation, preservation of local languages and traditions, and opportunities for knowledge exchange. Ecotourism, management, and research initiatives can generate employment, while cultural heritage programs can safeguard Indigenous languages and customs. The Kanashen Amerindian Protected Area exemplifies this, where conservation efforts are intertwined with the preservation of the Waiwai community's cultural heritage. Such initiatives not only enhance community well-being but also strengthen the cultural fabric of the region.

5 **Accessing international financing for biodiversity conservation.** Designating the area for conservation will unlock international financing opportunities dedicated to biodiversity conservation and ecosystem services. These funds can be channeled into capacity-building initiatives, including monitoring and evaluation programs, to ensure effective management of the conservation area. The Global Biodiversity Framework emphasizes the need for increased funding and enforcement of conservation efforts. By tapping into these financial resources, Guyana can bolster its conservation infrastructure, enhance local expertise, and ensure the long-term sustainability of the protected area.

6 **Ensuring connectivity between protected areas.** A new conservation area will enhance ecological connectivity between adjacent protected regions both within Guyana (Kanashen Amerindian Protected Area) and internationally (Brazil's Grão-Pará Ecological Station). Surrounded by intact forests along its entire boundary, there are further opportunities to protect adjacent undesignated lands to ensure even greater ecological connectivity with other nearby Indigenous lands and protected areas (Kanuku Mountains Protected Area). This connectivity is vital for migratory species, genetic exchange, and overall ecosystem resilience. The Guiana Shield is one of the world's last wild places, with relatively intact forests that support high biodiversity. By linking protected areas and Indigenous lands, Guyana can contribute to the preservation of this critical ecological corridor, facilitating species adaptation and movement in response to environmental changes, and management at a landscape scale.

7 **Establishing biodiversity research stations for collaborative, non-extractive research.** The creation of biodiversity research stations in this region has the potential to generate globally significant biodiversity data, and will also more generally promote environmental monitoring, conservation science, and knowledge exchange with local communities. For instance, the recently launched research and education center at Sophia Point in Guyana aims to protect the country's biodiversity and study ecosystem health, focusing on research that supports sustainable economic transformation. Implementing similar centers in the new conservation area will enhance Guyanese science—research conducted in Guyana by Guyanese professionals and their partners—while also contributing to global biodiversity conservation efforts.

8 **Establishing clear Guyanese use of an area adjacent to disputed zones.** Designating the area as a conservation zone reinforces Guyana's sovereignty and clarifies the nation's use of territories adjacent to disputed regions. By proactively managing and protecting these areas, Guyana can assert its commitment to conservation and sustainable use, thereby strengthening its territorial claims and promoting environmental stewardship in regions of geopolitical sensitivity.

THREATS

The remoteness, isolation, and topography of this region combine to produce a landscape with few credible or imminent direct threats. Due in large part to limited accessibility, there is no permanent human presence inside the Acarai-Corentyne Corridor, no small- or large-scale ranching or agriculture, and no current commercial timber extraction, which together means that the threat of deforestation is extremely low. There are also no commercial harvests of food fish or game species and so hunting pressure is very low, primarily concentrated within and along the main rivers. Together, this tiny human footprint leads to an environment that is remarkably undisturbed and well-preserved, with pure, clean, and healthy waters. In the post-inventory workshop we identified a few threats that should be taken into account by any conservation solution for the region. Further work is needed to thoroughly evaluate threats to the upper Berbice expansion area, which is much closer to areas to the north with logging roads and pressure from commercial timber, mining, and hunting (see Alonso et al. 2018). These were not considered in the workshop but are addressed here in preliminary terms. We have arranged the threats here in descending order of perceived danger:

01 **Legal and illegal mining** for gold and other minerals, which is currently small-scale and incipient in the region despite some existing prospecting permits in the Corridor, but which can spread rapidly and result in:

- the long-term poisoning of food and water resources
- deforestation and illegal road-building
- destruction of watercourses and other aquatic habitat through erosion and siltation
- social instability and the growth of other illegal activities
- existential challenges for conservation areas

02 **A conservation solution developed without the expertise and collaborative input of nearby Indigenous communities**, which would reduce its sustainability and effectiveness. This threat is exacerbated by:

- government-community relationships that are currently underdeveloped
- deep wells of ecological knowledge that are currently undervalued, in part because language barriers hamper the transmission of expertise
- a limited understanding of how and where local communities use resources on the landscape
- concerns of local communities that conservation may impose restrictions on current activities, employment, and income
- lack of land title for Cashew Island (Kasuela) and pending land title for Parabara

03 **The potential emergence of regional threats,** both from within (via increased access) and outside of Guyana, including:

- new or advancing roads, a long-term threat that is currently far away from most of the corridor but of more pressing concern in the upper Berbice
- logging and deforestation, such as renewed timber operations in the upper Berbice or encroachment from Brazil to the southwest of the Acarai-Corentyne Corridor
- illegal or licensed mining concessions, with downstream pollution, sedimentation, and depletion of soil nutrients. Recently shuttered gold mines in Brazil could encourage miners to illegally cross into southern Guyana
- commercial-scale hunting and fishing

04 **A landscape so large and remote that effective management will require a great deal of resources** from communities and government:

- lack of technical training and access to emerging technologies for local communities, diminishing their capacity for collaborative management
- the inevitable disconnect between Georgetown-based decision-making and management needs of this vast and inaccessible area of the Guyanese interior

05 **New and potentially unstable financing instruments and strategies** that promise to provide long-term support using mechanisms like green bonds, carbon, freshwater, and biodiversity credits, and project finance for permanence:

- a limited global track record for these models, and limited experience in Guyana
- concessions whose development models might involve extractive use (e.g., logging or mining), or that only protect the area for a limited time

06 **Erosion of local knowledge, culture, language, and traditions,** exacerbated by limited job opportunities to sustain local livelihoods in situ

07 **The prospect of international conflict** due to territorial disputes in the adjacent New River Triangle

The establishment of a new conservation area between the Essequibo and Corentyne rivers presents a multifaceted opportunity to advance national and global biodiversity commitments, empower local communities, protect critical ecosystems, enhance ecological connectivity, and assert territorial sovereignty. This initiative stands to yield significant ecological, social, and political benefits for Guyana and the broader global community.

The primary goal of the November 2024 workshop was to compile recommendations in support of Guyana's stated vision of establishing effective, science-based, and equitable conservation areas. These recommendations were based both on the field team's direct experience in the corridor and the collective expertise of the governmental, academic, and non-governmental professionals who convened together. Our intent was not to draw up a prescriptive roadmap nor recommend a specific conservation solution for the area, but rather to consolidate ideas from the assembled group's breadth of expertise in support of Guyana's vision for globally significant conservation action. The following recommendations have been refined and elaborated since the workshop as the scientific team further processed findings about this unique part of southern Guyana.

Because the November 2024 workshop was too incipient to offer the kind of broad-based support that a lasting conservation solution in the Acarai-Corentyne Corridor will require, ***our main recommendation*** *is that the government of Guyana:*

- **Formalize a multi-stakeholder task force** to serve as a broad network of expertise, support, and feedback as the government advances its conservation goals in southern Guyana. This includes work to:
  - meet the national commitment to "a transparent, multi-stakeholder process to establish new protected areas in Guyana's terrestrial and marine territory" (Government of Guyana 2022, 30–31)
  - expand engagement with local and regional actors, especially Indigenous communities, near conservation priority areas
  - improve coordination between national government agencies whose scope of work relates to biodiversity conservation, protected areas, Indigenous peoples, and forest and water management
  - leverage conservation expertise from non-governmental and academic sectors

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Additional recommendations include:

- **Achieve lasting, legal protected status** for the Acarai-Corentyne Corridor. This includes work to:
  - ensure the involvement of local Indigenous communities from the earliest planning stages for the new conservation area

- formalize an official change in land use status, backed by compelling technical arguments and a long-term vision for conservation
- provide additional protection for freshwater assets and the headwaters of Guyana's largest rivers, which will remain vulnerable to degradation even if the Acarai-Corentyne Corridor is protected as the corridor includes only one bank of each river
- keep the Essequibo and New rivers free-flowing and wild by banning dams and minimizing dredging of any kind
- remove all outstanding mining, prospecting, logging, and other such claims to the landscape and block new claims in perpetuity
- map any roads, formal or informal, in the vicinity of the corridor and implement a plan to prevent their expansion into the area
- advance a conservation vision for Guyanese forests adjacent to the Acarai-Corentyne Corridor, so that the corridor anchors a mosaic of protected landscapes with a diversity of uses and governance models

➨ **Proactively explore governance types and sustainable funding mechanisms** that will secure the area's long-term conservation future. This includes work to:

- achieve the LCDS 2030 commitment to diversifying Guyana's protected areas network and co-managing conservation lands with local peoples via a careful weighing of potential conservation categories and governance arrangements, including both protected areas and Other Effective Conservation Measures (IUCN-WCPA Task Force on OECMs 2019)
- identify and build financial pathways that can provide sustainable funding for the management and monitoring of any new conservation area as well as opportunities for benefits to local communities
- avoid conservation models that protect the Acarai-Corentyne Corridor at the expense of other places (e.g., biodiversity credits that can be used to offset conservation impacts elsewhere)

➨ Design and implement **effective, equitable, and adaptive governance and management** for the Acarai-Corentyne Corridor that follows the guidelines laid out in the LCDS (Government of Guyana 2022) and positions the new area for eventual inclusion on the IUCN Green List of Protected and Conserved Areas (IUCN and WCPA 2017). This includes work to:

- involve local communities in planning, governance, and management activities in a way that provides real benefits to the communities, the government, and the corridor
- map existing resource use in and around the Acarai-Corentyne Corridor by Apoteri, Parabara, Kanashen, and Cashew Island (Kasuela) villages to ensure that management plans allow the continuation of sustainable, low-impact historical uses like fishing, hunting, and transit, and to guide potential zones of sustainable use

- leverage local ecological knowledge to optimize evidence-based management strategies throughout the region
- build on the abundant local experience managing conservation areas in Masakeñarî (Kanashen Amerindian Protected Area) and Apoteri (the former Upper Essequibo Conservation Concession)
- identify priority aquatic and terrestrial species and incorporate social contexts to develop zoning of the area and facilitate management planning and monitoring
- design a cost-effective strategy to monitor key biodiversity assets, freshwater systems, and ecosystem services of the Acarai-Corentyne Corridor
- explore transboundary conservation agreements with Brazil and Suriname that can provide information on shared assets and emerging threats in areas adjacent to the corridor.

➨ Ensure **conservation benefits are shared broadly and equitably** with neighboring Indigenous communities. This includes work to:

- seek a long-term land titling solution for the Waiwai and Trio community of Cashew Island (Kasuela), which currently has neither legal land title nor a submitted application
- complete the pending Parabara land title grant (Department of Public Information 2025), which neighbors the Acarai-Corentyne Corridor to the southwest
- use new management activities as an opportunity to create jobs for local Indigenous communities, especially in areas of the corridor where conservation action may lead to a decline in other potential sources of income (e.g., mining)
- use this opportunity to strengthen Indigenous management of Kanashen Amerindian Protected Area and review some of the challenges and lessons learned over its 10-year history
- align management activities and benefits, wherever possible, with the Village Sustainability Plans of nearby Indigenous communities.

➨ Use this opportunity to **boost research and exploration** of Guyana's poorly known southern region. This includes work to:

- continue to inventory the biodiversity of the Acarai-Corentyne Corridor in collaboration with local experts, focusing on habitats and taxonomic groups that have been poorly documented to date
- design and maintain tools that help connect local knowledge to research and management of the landscape and its biodiversity (e.g., field guides in English and Indigenous languages)

- install and maintain river gauges and meteorological stations at strategic locations within the Acarai-Corentyne Corridor, as part of Hydromet's strategy for monitoring climate and hydrology across Guyana
- strengthen other Guyanese institutions that are well positioned to document the area's biodiversity and manage its data and specimens (e.g., the University of Guyana's Centre for Study of Biological Diversity, the EPA's national GBIF node for Guyana)

- Complement actions in the Acarai-Corentyne Corridor with **clear communications to stakeholders, the Guyanese public, and the world.** This includes work to:
  - inspire a sense of pride and ownership across Guyana via communication campaigns highlighting the diverse values of the Acarai-Corentyne Corridor
  - establish and maintain clear two-way communication with local Indigenous communities regarding strategies, plans, schedules, conflicts, and collaboration related to the designation and management of the area
  - leverage Guyana's work in the Acarai-Corentyne Corridor for progress reports regarding the targets of the Kunming-Montreal Global Biodiversity Framework (Table 1).

For the upper Berbice and the ~100-km stretch of the Corentyne River that were subsequently included in the Acarai-Corentyne Corridor—but were not visited during the rapid inventory nor discussed during the workshop (see pages 18–19)—we further recommend work to:

- support additional biodiversity research in the expansion area in collaboration with local experts, including local Indigenous communities such as Apoteri
- map stakeholders and use of natural resources in these areas
- broaden the proposed multi-stakeholder task force to include additional local and regional actors near the upper Berbice and members of the 2014 upper Berbice rapid assessment team (Alonso et al. 2018)
- evaluate historic and current threats to these areas, with special attention to the network of informal logging roads in the upper Berbice watershed and fisheries along the Corentyne
- identify priority species for targeted conservation efforts that may only occur in the northern portion of the Acarai-Corentyne Corridor (e.g., arapaima [*Arapaima arapaima*] and freshwater fishes endemic to the Berbice River)
- explore the potential for transboundary collaboration between Surinamese and Guyanese communities and authorities along the Corentyne River, to manage fisheries, water quality, and other freshwater assets throughout the undisputed portion of the river, including the ~100-km stretch that borders the Acarai-Corentyne Corridor

Table 1. Twelve targets of the Kunming-Montreal Global Biodiversity Framework that the rapid inventory described in this report and the long-term conservation of the Acarai-Corentyne Corridor have the potential to advance (Convention on Biological Diversity 2022a, b).

Targets	Prospective contributions of Rapid Inventory 32 and of the Acarai-Corentyne Corridor
Target 1. Plan and Manage all Areas To Reduce Biodiversity Loss	Building a successful long-term strategy for the Acarai-Corentyne Corridor will help clarify the most appropriate solutions for the other large areas in southern Guyana that currently lack a well-defined land use.
Target 3. Conserve 30% of Land, Waters and Seas	The Acarai-Corentyne Corridor represents ~7% of Guyana's land territory. Formally protecting it has the potential to raise the proportion of national territory that is under conservation management from 8.4% to 15.4%, as part of Guyana's commitment to reach 30% by 2030.
Target 4. Halt Species Extinction, Protect Genetic Diversity, and Manage Human-Wildlife Conflicts	The Acarai-Corentyne Corridor harbors at least 20 species currently considered globally threatened by the IUCN Red List of Threatened Species.
Target 9. Manage Wild Species Sustainably To Benefit People	Food fishes, game mammals, and game birds are currently harvested in the corridor at subsistence intensities whose impact is undetectable. With abundant vertebrate populations and low hunting and fishing pressure, the corridor has the potential to provide a sustainable source of food for local communities over the long term.
Target 11. Restore, Maintain, and Enhance Nature's Contributions to People	The Acarai-Corentyne Corridor is a major source of freshwater for Guyana. It generates ~3% of the Essequibo River's total discharge, ~14% of the Corentyne River's total discharge, ~44% of the New River's total discharge, and ~4.5% of the Berbice River's total discharge, for a total annual discharge of at least 11.2 billion m^3. Other environmental services provided by the corridor include carbon sequestration, protection of soil and water resources, and flood control.
Target 13. Increase the Sharing of Benefits From Genetic Resources, Digital Sequence Information, and Traditional Knowledge	The rapid inventory documented a vast breadth of traditional knowledge among the Indigenous peoples who live adjacent to the corridor. This knowledge—which includes a large number of insights about biodiversity that remain unknown to western science—represents a major asset for conservation, for Guyana, and for these communities. Identifying strategies for deploying this knowledge for the management of the corridor and the benefit of Indigenous residents is a high priority.
Target 14. Integrate Biodiversity in Decision-Making at Every Level	With a deep store of local ecological knowledge and baseline biodiversity data from Rapid Inventory 32, the Acarai-Corentyne Corridor offers an opportunity to build and showcase a long-term land use strategy that is based on high-quality biodiversity information.
Target 19. Mobilize $200 Billion per Year for Biodiversity From all Sources, Including $30 Billion Through International Finance	Rapid Inventory 32 injected a significant amount of money into the economy of southern Guyana. The Acarai-Corentyne Corridor has high potential for generating self-sustaining revenue, both through financing mechanisms based on biodiversity and ecosystem services and through investments to government endowments such as the Protected Areas Trust.
Target 20. Strengthen Capacity-Building, Technology Transfer, and Scientific and Technical Cooperation for Biodiversity	The Rapid Inventory 32 team included 29 western-trained scientists from 6 Guyanese and 7 international institutions, as well as 49 local experts from 3 Indigenous villages. The 20 days we spent together in the field offered hourly opportunities for hands-on training in field methods, data collection, collaborative science, and synthesis of results. Some Guyanese members of the team received additional training opportunities at the Field Museum in Chicago as specimens from the expedition were processed and identified.
Target 21. Ensure That Knowledge Is Available and Accessible To Guide Biodiversity Action	The results of Rapid Inventory 32 will be made publicly available on a variety of different platforms. All biodiversity data will be compiled and published on the Global Biodiversity Information Facility (GBIF). The team is committed to ensuring that information from the inventory is delivered to the Guyanese government, the Guyanese scientific community, Indigenous communities, and the general public.
Target 22. Ensure Participation in Decision-Making and Access to Justice and Information Related to Biodiversity for All	This was one of the most collaborative scientific expeditions ever undertaken in Guyana, with a diverse mix of Guyanese scientists, Guyanese government agencies, Indigenous peoples, and international scientists. Our youngest participant, a PAC park guard, was 19 years old; our most seasoned, a US-based scientist, was in his seventies.
Target 23. Ensure Gender Equality and a Gender-Responsive Approach for Biodiversity Action	Rapid Inventory 32 highlighted female leadership in conservation and biodiversity science. Eleven outside scientists and six local experts on the field team were female. The overall team leader, the leaders of the mammals and fishes teams, and a number of the Guyanese conservation leaders who supported the team from Georgetown were female.

EXECUTIVE SUMMARY—WAIWAI

2024 cimñipu rakataw exataw, Guyana pono komo roowo yukurunpeñe komo takî ñesencetkñe Field Museum yawno meyan komo yîtînoñe komo yakro antomatopo komo poko. Comota chewno komo entopo poko. Ahce komo xa wa nay comota chew ha kacho poko, yîtînotome takî yîwyaso. Essequibo comotan taa New River comotan chewno komo. Ero roowo yîtîonxapu takî nosohtoche Acarai-Corentyne Corridor me. Ahce kacho yîtînopoxe xatîkeñe esentatopo yaw takî eropoko nîmtapowaxe ero roowo wokpamatopo poko yukurunpe topo poko marha takî.

Iitono roowo pokono

Acarai-Corentyne Corridor wa nay 1.5 million hectares comota, apori komo, îîpî komo marha, ero wa nay Southern Guyana nexa. Guyana po nay asakî poren epuimo komo. Xehxa nay Essequibo. Mexa takî nay kamo yîpatakacho ñixa New River rakataw wa nay ero roowo yîtînoxapo. Comotaimo me xa nay ero roowo, îîpî me xa marha nay.

Mehxan anarî ewto pono komo, paranakarî way komo meîpora xa yîtînopora natu ero roow yehtopo poko. Ceipu nay iina kîwtotopo, wara makî tohra. Kicicitho komo kahxi exirîke. Iito ro no komo re ha tooto komo. Nîtinoyatu ero roowo poko ehtopo komo pahkî pahxa marha iito cexirî ke so. Asakî ewto komo nay ero roowo panaw, Waiwai, Tirio komo yewton. Wapîxana, Wawai, Makuxe yewton komo marha natu xehxa panariro.

Mehxan (paranakarî) cetapickaxmu komo totoponho komo pokono

Onî yîmaw 5–24 November 2024 ona cetkeñe:

Essequibo pore ro

Eeta Amuku (Wiiîa yîîpîn)	5–11 November 2024

Essequibo taa New River yakro porero

Eeta Monkey Jump	11–16 November 2024

New River porero no makî

Eeta New River	17–24 November 2024

26 November pok takî cetapickaxmu nînhîrî komo takî ñesencetkeñe, 19 Guyana pono roowo yukurunpeno riñe komo yakro. Iito re takî amna tapota ciitopo poko ñetapickeñe on wa kacho me: Ahce xa ero roowo kaîpe iitororo ñiira ha? Ahce komo nay yîwîrîmañe? Ahce komo takî cewyumaxmume nay iito? Ahce wa takî on yîpu ciisom me nay cewyumaxmu komo?

Citapixkaxmu komo yîtapickatoporo pokono

Ceske katkeñe cetapickaxmu yîtapixkatopo komo. 25 komo xatkeñe comota chew tanhamyan komo pokono. 3 takî xatkeñe toto yehtopo pokonorohara. Cewnhe xañe topu pokonoro. On pokonoro komo wa xatkeñe Guyana pono komo taa paranakarî komo yakro. 49 komo takî xatkeñe 3 ewto poi no komo. Topu poko, tuna poko, roowpoko, weewe komo poko, kitmo poko, pororî warai komo poko, tuna kwawno iipîpono cesom komo poko, torowo komo poko, poñko warai komo poko, rere komo poko, eDNA poko xatkeñe ero yîpu komo poko xatkene.

Enxapu komo pokono

Acarai-Corentyne Corridor po amna neñe kirwan tei kahra ro makî ka comota komo, comotachewno, îîpî pono, tuna kwawno komo marha. Meî pora ma ka nay exihra ka nay yîwîrîmañe komo. Meî pora marha ka nay porento komo comotachew no ro komo, kamara warai komo. Epu piñan komo kawu no weewe yîpu komo rma ka meî pora nay ero ke takî iitono comota yîchewno komo nay kirwan ciisom me. Roowo ka nay iitororo paxan nînhîrî wara rma tîwîrîmaxe exihra. Karpe rma ka nay iitono yîtînotopo. Karpe iitorma ka yîtînotopo. Paxan pîn komo mewretho topu po iitono toto komo kirwañe takîso ero roowo poko xatkene pahxa ro makî orotono ponaroro rma.

20 kamo exitaw amna nukuknomai 600 anarimen pan weewe yîpu komo, 754 takî anarimen pan tanhamyan cetaresom comota chew no komo. 31 takî anrîmen pan komo nence Guyana po enînînro komo. 35 takî anrîmenpan komo nence enînîro xa takî anarî roowon po so. Meŕpora rma ka nay anarîmen pan censom komo pahkînhe ero yîpu poko cexitawso.

	Anarimenpan komo enxapu etapickatopo yîmawno	**On wiicakî nay iito kaxa po nînhîrî enxapu komo yakro**
Takem komo weewe	>600	>2000
Kîtmo komo	234	>400
Asakî ciisom komo tuna kwaw iipo marha	47	86
Tuna kwawno komo (watwa warai komo)	51	92
Torowo komo	339	445
Porento komo, xawyakanhe tanhamyan ciitarisom komo comota chew no	38	42
Wahrai yi ro komo tanhamyan ciitarisom comota chew no	17	38
Rere komo	28	112
Ahnoro anarîmen pan naatu kom tanhamyan ciitarisom komo yukunomaxapu	**>1354**	**>3215**

Ero xexa komo iitono kaŕpe niiŕa chewyumaxmu ma ehtome

01 Kirwan comota, aporî komo marha nay, on nîmîcesî anarîmen pan komo naatu, tanhamyan ciitaŕ esom komo marha. Toto komo marha takronomacho ero comota (roowo) enxapu poi.

02 Ero roowo enxapu mîtwono ewto pono komo comota poko nîtînoyatu. Pocho pen komo yai asîxap comota poko yîtînotopo nîcamyaxe karpamxan komo ya. Ero yîtînotopo ke takî ero roowo kirwañe takîso niiratu amñen me miyaroronome.

03 Ero enxapu roowo yai asakî porenî epu komo ñihciya. Ero tuna kirwan nîmyasî ahnoro Guyana porero.

04 Naatu komo, tanhamyan ciitarisom komo ero yîpu komo rma nay Guyana, Suriname, French Guiana po. Amazon po marha nay tantono weewe komo warai. Ero ke on roowo nay cewñyan warai wa ero yîpu exihra nay anarî roowo po so.

05 Ceipu ero pona cewtotopo nay mooxe xa exirîke. Îîpîmo komo keñe, kaximo kicicitho komo keñe marha nay. Ero ke takî anarî ewto pono komo ero roowo enxapu pokohra naxe meŕpora xa.

Roowo yîwîrîmañe komo xe xa

01 Ouru poko iito cixitawso comota, epu aporî komo takwa nay cerepesom no wara. Kotî kînahrî komo marha takî nîwîreme, tuna pen marha takî nîwîrîmesî.

02 Comota poko yîtînotopo takî iito ewto pono komo nîcamnoyatu. On wara exitawso, karpam xan emasî komo tîmtapotarî yaro yîmtapotara exitaw anarî yîmaw toto komo eñepera natu ero roowo enxapu pona.

Roowo yîwîrîmañe komo xe xa (continued)

03 On pokono yîtîpîrî komo mooxe ro makî natu Georgetown po iitono ewto komo yai. Ero ke camkî naxe toto comota yîtînotopo poko.

04 Cemñipo marha takî anarîme nasî cetanomaxe, roowo pen marha takî ocororomakî nasî ocho. Pahkî marha takî katpan me nasî komo me makî comota komo marha takî anarîme nay.

05 Anarî roowo pono Suriname taa Venezuela pono komo, Guyana roowon pen tîwyan komo me ahsîxe naxe etîrwonîmtopo komo me takî nasî ero roowo enxapu poko.

On wara xa cecerî kacho pokono

01 Kayaritomo komo yakro, iitono ewto komo yakro, roowo yukuronpeñe komo yakro, iitore cetapickpore nasî ero Acarai-Corentyne Corridor pono roowo yukuronpetopo poko yuhnonhe.

02 Ewto pono komo takî iitore ero roowo, comota poko ehtomeso pahxa cetoponho komo yawroro rma iina cetu ahce na komo poko ehso.

03 Iitono ewto pono komo comota chew tetoponho yîtînotopo cirpore nasî paranakarî komo yîtînotop yakro. Ewto pono komo yîtînotopo komo ke takî ero roowo nukurunpetu.

04 Puranta nexpe ero roowo takarupesan emapona entopo yepetho me. Anarî yaxan roowo tukurunpesom exitaw entopo yepetome mero.

EXECUTIVE SUMMARY—WAPISHANA (WAPICHAN)

2024 sakoda'a Guyana Protected Areas Commission pishan Field Museum ikinao pidannao îdawatu tin naka kizi na'apain îsaada kizi pabi'inaka kida'o aimaakan kida kanoko ii Chiipi wa'o napain Pa'inao wa'o sakoda'a. Wa-dakotan wuru'u amazada na'ii Acarai-Corentyne podoapakizai. Kanom nii wa dawatu na'azo mizu, wa-aipan waikodan kanoko manawunu. Turuu kizi wadi'itapa nuzu karodapakaru nii sabata karunii diini'iti'otan-naanii.

EXECUTIVE SUMMARY—WAPISHANA (WAPICHAN)

Îamazadan

Wuru'u Acarai-Corentyne podoapakizai baoko putinpan 1.5 million-hectare kanaa kanoko kida waozi kida na'apain midukuo kida wakadapu antanapa Guyana dyo ii ikodo kao dya'utam idaru kidao Guyana wa'o oza. Sakoda: wuru'u Chiipi Wa'o napain Pa'inao wa'o. Ipai wuru'u amazada na'ii kanoko îpaida ni'inaa pa duubarun kida.

Pidan nao paniba'ikinao aonaa îaich pan wuru'u amazada da'u. Kashapan nao amazada na'iti ikodinkaru kanomnii kaina'a doko'o kida'o tozowan na'apain kachana'iti kii kida'o. Mazan kawiiziinao kaiwaapa nii wuru'u kanoko kotuao di'iki atii kai na'apain iaitapa kaimaindaun îdau. Kaina'a dya'utam wiizai kida maonapo na'ii Wai Wai nao na'apain Trio nao wiizi. Kaina'a kapam Wapichan nao, Wai Wai nao na'apain Makochi nao wiizi kida na'iaka.

Amazada kida dawatutinanao morowan nii

Kaudinkaru doon 5–24 November 2024, moroo wautu kariwai amazada kida:

Chiipi wa'o kowuzo

Wiiziibai Amuku	5–11 November 2024

Chiipi wa'o na'apain Pa'inao wa'o kowuzo

Wiiziibai Powatu zaka'utu kizi	11–16 November 2024

Pa'inao wa'o kowuzo

Wiiziibai Pa'inao wa'o	17–24 November 2024

Aizii 26 November doon dawatutinankainao sakantan îbaokoputinan 19 bakadin kiddo Guyana conservation zowaunau nao tum. Naii wa kaudinan baokopu wakian: kanoom kanoko ii imanawun kidao? Kanoom kashartin pao kida nii? Kanoom kaudin kizai nii kida ikazanaata karudon? Kanom paradakarukida wa di'ichapan wa sha'apatan wa kazanaata'azon ana amazada na'ii?

Kaudinaanao na'apain îkaudaunkizi kida

Pabi'inaka kidao aichopainao kaudinkaru doon: 25 biologists, 3 social scientist na'apain 1 geologist. Wunao aichapanaowuzu kida Guyanese nao wuru'u na'apain parambazai kiinao. Kaudinaanao bi'i na'aa'o 49 wabi'iikuinao 3 wiizai diiki: Masakenari iki, Parabazu iki na'apain Cashew landing iki'inao. Wa wunuutan kuba kaduzu kida; wuun na'apain imi'i kida; aimaakan kida aichapakariwai; paoriibau na'apain atumun kadunaa kida; kopau kida; kibara kaduzu kida na'apain kowazaza kaduzu kida; kotu'uzu kida; na'apain tamuruo kida.

Kanom ikodo kariwa

Wa kodo konoko na'apain ipai mashaapa wunui kidaza iribindapain zio daun Acarai-Corentyne podoapakizai ii ipai îbaaran na'apain wuun baoko kaimain kapam. Iribi idaru kidao wunu'u napain do'oko'o kida'o atamun kadunaa kida. Uru'u idi'o kanoko manawan na'apain kaimainao ziowu'o îtaapan aimakan kida. Kaimain daun kawiizitinpainao aichapan pawiizi da'u na'apain kaina'a wadokozinnao saadanii kubu baara an kida. Kawiizinao wuru'u aichapao razu pataapan amazada kaimain kotua'o di'iki atii kai.

20 kamoo Sakoda kaudinkaru doon wa ikodo 600 pabi'inaka bakadun kidao paoriibau napain atamun kaduzu kida napain 754 pabi'inaka kidao wunu'u kaduzu kida. Na'ap kapam 31 bakadun kidao wunu'u kaduzu kida aonaa zii kaudinaanao da'an'a Guyana an tukupauzon. Bao ran kapam 35 bakadun kidao aimaakan kida kaudinaanau aonaazii panadon îtukapauzu karu aonaa na'iam. Kana'a iribi waaichap waikodan niizi mazan wa aiap pawa'azii idawuan wana'an da'an'a.

	Tukapu karawau kida ka'dinkardon	**Kana'anao imashapan wuru'u amazadan naaii**
Paoriibau otmun kaduzu kida	>600	>2000
Kopau kida	234	>400
Kibaru kaduzu kida	47	86
Kowazaza kaduzu kida	51	92
Kotuuzu kida	339	445
Idaru kidao napain duso'ozaa kidao wunu'u kaduzu kida	38	42
Korii yarawara kaduzu kida	17	38
Tamuruo kida	28	112
Baokoputinpan	**>1354**	**>3215**

Kanomkida na'ii (imo'ozokanaa) kazanaa ta'azo karudon

01 Ziowu'o kanoko napain iwa'ozi kida itoman îtaapan kaimain iribi pabai'inaka atmun kaduzu kida napain wunu'u kaduzu kida (wa'ozi kida kaminka'utu pidannao îkaiwa pamakoamp kinaniitponaa wur'u).

02 Pidannao kawiiziinao wuzu nai'i aichap kaimaindaun kanoko da'u. Tunarunaonao dobatu kida ipai wuru'u paaichapanuzu kanoko da'u pa'inaanaoati. Ũoichapanuzu napam patapan kanoko uruu idian turuu kanoko tapa kao.

03 Day'utam kazoo kiidaoraz Guyana wa'ozan kida sakadinan na'ii. Ũnao taapao raz kaimaina'o wuun ipai Guyana ati.

04 Paoribau atamun napain wunu'u kaduzukida ikoda karwuzu Guyana an, Suriname iaka napain French Guiana iaka napain Amazon ia'o ipai kana'a wur'u amazada ii, uruu idian itukapunan imanawun.

05 Wuru'u amazadazu kasha'apanao morowautu karu na'iti isha'apanumidi munapu, doko'o kida midukuo napain Kachan iti kii kidao tozowan kida. Uru'u idi aonaa panibaukinao pidanao morowautan na'iti nanawun.

Kanom kasharata'o nii

01 Gold tapkar doon napain aiapa karawau kubu kida so'otu kardoon na'ii ũatamikitan nii kanoko napain wa'ozi kida kamaindaun. Îpaisin tannii wa wanukunu kazuzu kida napain u'antami nii wa'ozi kida.

02 Kawiiziinao aichapan kanoko da'u manaabatinannii, aitunimain aonanan pa'inanao pidiannao paradapa paparada pawa'a aonanan kawiiziinao tapadakao ikaiwaupan kanoko paw'a.

03 Naubanainao mashapan munapu wamum ii wuunao kawiiziinao ai noubanainao aonaa iaichapan na'apam imanawununun kawiiziinao aichapan patapan kanoko.

04 Bakadin tina'anaa amazada aizii, uru'u idi wicha'anaa manawun amazada, waraokan daowuu kich'anaa manawun, baukap kanoko bakadin tina'azon diniiti.

05 Ba'oran wiizai nao Suriname napain Venezuela kazata'ozon amazada kida Guyana ai. Uru'u tomanii kashartinkar nai'iaka.

Paradakar sha'apatinkiinai

01 Baokopu kaudinkar naubanainao tum, kawiiziinao tum napain paniba'ikiinao sha'apapaoraznaa na'apa kidao NGOs napain paonariinao wakazanaatu kizi Acarai-Corentyne podoapakizai kaidanaa.

02 Wa ka'iduwaka patumak baokopo ipai kawiiziinao napain wiizii kawanati wur'u purata idi wa sabataan an kanoko winipunaa. Marinau kizi kawiiziinao pakawan imakon ikaiwapan ipai aimakan kanoko i'aka îkaiwaapauzon kawan.

03 Marina'akizi kawiiziinao aichapan kazuzu kaiwaa kao diniiti kaipa'o dorotin kar doon. Napain na'apan inao tapan kaduzu kanoko kaiwaakao amazada kazanaatu pa'azokao an.

04 Mishu pa'i purata ikodo kao kanoko kazanaata'azokaran kana'akizi kazowautinpanao napain aonuutupanao puratana kainaan pa'inao toma'azo kaoanati kaiaoraz naa ati kapam.

EXECUTIVE SUMMARY—TRIO (TARËNOTON)

2024 irantato irowë ahtao Guyana ponton nono entuton wëturuto rîneto Field Museum awënton ohînpëkenton iwarëton akërë orokoeme iwehtohonpë ituhtaonton eneto pë atîtomorën nai ituhtao ipunëhtome Essequibo itupo ma New River ituponton irë nono po ipunëpîpe eka. Ma New River ituponton irë nono po ipunepîpe ekahtëneto Acarai-Corentyne Corridor me marë. Atî ipunëpîseto tese irehtao irëpë wëturuto irë nono intakato tîkurunke iwehtome marë irë.

EXECUTIVE SUMMARY—TRIO (TARËNOTON)

Iirë nono pëkën

Acarai-Corentyne Corridor 1.5 million hectares itu, ipërihto pîîton mare irëton nai Southern Guyana wenje Guyana po na 2 me apon mono. Senje nai Essequibo ma mënje nai wei iwepatakato weinje New River nono irowë nai ipunëhpîpë iitu mono ma pîme marë nai irë mënjan pataponton pananakiri aponto irë. Inpunësewato nai irë nono iwehtopë antînao nai irë pona wîtëto naken tëewa tîkurunke iweike ma irëponto nai iwarë irë nono iwehtopë penato tese iweike. 2 me nai irëpo nono ekunnë Waiwaiton Trrio ton marë. Ma senje nai Wapisana ton, Waiwai ton, Makusi ton ipata.

Mënjanton (Pananakiriton) orokomanton itëtoponmpe maon serë

Serëmao 5–24 November 2024 sërë ponato:

Kîntên Essequibo wararë

Kanpu Amuku (Kurimau pi)	5–11 November 2024

Essequibo mo New River marë ëisaporo

Kanpu Tarîpi iwesikatoponpë	11–16 November 2024

New River iranman serë

Kanpu New River	17–24 November 2024

26 November po orokoman nonpëton wëturuto rîne 19 Guyana pon nono ikurunmane ton akërë tîpatoro iwehtopë anja orokome kînei serë apo katome atînai irëpo nono karime tîrîne? Atîton nai ikërënmaneme irëpo? Atîton nai tîpînen irëpo? Eke nai sena ponton tîrënme tîpînento?

Orokome tesenton pëkën serë

Tîwërëken to kînahë orokome tesenton orokome iwehton. 25 manton kînahë ituhtao okînpëkenton pêkën. 3 me kinahë wîtoto iwehto pëkën. Ma 1 kînahë tëpu pëkënnoro irë pëkën ton kînahë Guyana ponton ma pananakiriton aakërë tesenton. 49 meto kinahë. 3 pata ponton me. Tëpu pëkën, nono pëkën, wewton pëkën, kana pëkën ton, përëru aponton tunahaun ton ituhaonton pëkën, tonoroton pëkën marë, ponjeke aponton marë, nereton marë eDNA pëkën ton marë kinahë irëton pëkën kînahë.

Ennepë ton pëkën

Acarai-Corentyne Corridor po anja kînei kurano tae kaewankërë pitë ituhtaon ton pî ponton ton tuna haun ton marë. Tërënkë nai itu wakenen kërë nai ihërënmane ton. Tapîîmen kërë nai ituhtaon tonmon kërë kaikui aponton weweton kërë marë tërënkërë nai kawë kawë ton weweton kërë nai tërë irëme nai ituhtao ton kure tirîpore nai nono marë kurenkërë irëme nai kure tîrîpore nai nono ma irë po antinao kërë nai irëpon ipunëhto penarë timenuhtëe tepupë tîmenuhtee pe ire ponton wîtoto ton junme tese irëpë penarë kure tîrëe ijane seremaon ponarën.

20 wei ahtao anja kinkuhtuntë 600 me. Oninpë mëken weewe epi ton 754 me ohînpëkenton tëhkëhke ituhtaon ton. Ma 31 me oninpëken eneneto Guyana po enepînton. Ma 35 me oninpëken eneneto enepîntomorën irë tîwërën nonopo. Ijetankërë nai tënenton kapohtasa irë aponton pë ahtao.

	Onipëkenpë meken enepë oroko wehto mao	Serë apo nai irëpo tîrîpe
Tari kenton wewe	>600	>2000
Kana ton	234	>400
2 me nai irëpon tuna haun pîîpo marï	47	86
Tuna haun ton ariwe aponton	51	92
Tonoro ton	339	445
Monoton ipëkënton ohînpëkenton tëhtëketon ituhtaon	38	42
Akîi pisi ton ohînpëkenton tëhtëke ituhtao	17	38
Nere ton	28	112
Oninpëmeken nai ituhtao ton ikuhtuntepe	**>1354**	**>3215**

Irërëton irëpo iweike tîpînenton me iweike tîpîne nîrijan

01 Kurano iitu ipërihton marë nai. Serë ohînpëkenton tëhtëhke ton wîtoto ton inarë tokoron mato enene irë ituh pëe nono marë.

02 Irë nono enepë pataponton ëiwarëto nai itumurunpë kon pëe apeipe nonopë iwarëto nai irëjanme kureto nono rîjan taneren iwehtome.

03 Ire enepë nono pëe 2 me nai mono apun nipitën ire tuna kurono apon Guyana wararë.

04 Tonai ton ohînpëken ton tëhtëkehton ire apontton nai Guyana, Suriname, French Guiana po Amazon po marë nai senpon ton wewe apon irëme sen nono nai. Iken ire epî apon nai waken tîwërën nonopo marë.

05 Antînao irë pona wîtëto nai maarënken iweike. Pîhton pije ituruimë pije marë irîpî pije marë nai irëme hasan tîwërënton irë nono ipëhtato nai tapîime nono ikërënmane ton.

Nono ihërënmane tomorên

01 Koutupë irëpo ahtao to itu apun marë nihërënme nai kotî kërepa marë nihërënman.

02 Itupë ipunëhto marë pataponton pëerato nejan. Sere apo ahtao kîrîmokuton wërîmukuton marë tîjomi kon inontanto irëmao. Tîwërenmao wîtototon itësetanrënto nai irë nono erahtëpe pona.

03 Serëpë nai iputupëkon maarë nai Georgetown pata ponton irë petaton pëe irëme nai wîtototon ëiwame irë itu pë.

04 Irantato marë nai tîwërëken teese nono marë nai atuma nai pëh. Kahpota marë nai awainme weime marë nai itu marë nai tîwërëken.

05 Tîwërën nono pon marë nai apëiseto Suriname, Venezuela marë nai apëiseto nai iwëeratoe mahtohonme nai irë nono apëipe.

EXECUTIVE SUMMARY—TRIO (TARËNOTON)

Serë apo hasan kehtëne kato pëkën serë

01 Kapitenton akërë, nono ikurun maneton akërë ëisaporo orokome kehtëne katopë Acarai Corentyne Corridor pë nono ikurun mahtopë samekensa.

02 Pata ponton marë ëisaporo irë itu pë ëisaporo iwehtohonme pena tîwehtoponpëkon taerë marë tahen nîhtahi atîrënna pë ese.

03 Irëpon pataponton ituhtaon tîrîpore nai pananakîrîton inpunëpî akërë pataponton ëiwarë iwehtoke hasan irë nono tîkurunke nejan.

04 Karahuri nejan irëton ënene irepeme weiwararë eneto irepeme akoron nono erahtëpë irë irepeme marë nehtan.

PRIOR BIODIVERSITY SURVEYS AND EXPECTED SPECIES LISTS

Authors: Nigel Pitman and Kevin Winner

INTRODUCTION

In advance of the rapid inventory, we compiled existing biodiversity data in southern Guyana and neighboring regions and used predictive models to convert those data into expectations about the plant and animal diversity of the Acarai-Corentyne Corridor. These expectations were not just useful in providing a context for the team's fieldwork; they also represent a scientifically rigorous answer to the question of which species likely occur in the area.

PRIOR BIODIVERSITY SURVEYS

To compile published information generated from prior work in and around the Acarai-Corentyne Corridor (Fig. 16), we downloaded georeferenced records from global clearing houses of biodiversity data (the Global Biodiversity Information Facility, Map of Life), searched specimen and photographic databases maintained by individual natural history museums (e.g., the Field Museum, the Royal Ontario Museum), reviewed the scientific literature and unpublished reports, and corresponded with a number of experts.

Table 2 lists nine historical biodiversity surveys carried out inside the Acarai-Corentyne Corridor since 1837. This is a small number for such a vast area. The scope of these surveys is also very limited; four of the expeditions focus on the same short stretch of the Essequibo River between the Kuyuwini and the Kassikaityu rivers, and most expeditions lasted just 2–3 days.

Figure 15. Field Museum ornithologist Emmet Blake on the Essequibo River in 1937. The following year, he surveyed bird communities at 11 sites along the New River, from the Acarai Mountains to the Corentyne River. Photographer unknown. ©Field Museum of Natural History.

Table 2. Biodiversity surveys carried out inside the Acarai-Corentyne Corridor, 1837–2012.

Years	Surveys	Taxonomic groups
1837, 1843	Explorer Robert Schomburgk made a small number of observations along the Essequibo River between the Kuyuwini and Kassikaityu rivers (Burnett 2000, van Dam 2002, Rivière 2006a, b).	plants, fishes, birds
1937	In 1937, entomologist William Hassler of the American Museum of Natural History collected a small number of bee specimens along the Essequibo while traveling through the area as part of the museum's larger Terry-Holden Expedition to British Guiana (Schwarz 1940).	bees
1938	Between August and October 1938, Field Museum of Natural History ornithologist Emmet Blake collected animal specimens at 11 campsites along the New and Corentyne rivers (Blake 1950; Fig. 15).	birds, fishes, mammals
1963–1966	Over a four-year period, naturalist Stan Brock collected a small number of mammal specimens in the vicinity of Amuku Creek, a tributary of the New River.	mammals
1969–1970	As part of a national forestry survey of Guyana, large trees were surveyed at a small number of sites along the New River (de Milde and de Groot 1970, ter Steege 1998, 2000).	trees
2002, 2007, 2008	Conservation International sponsored multiple biodiversity surveys at the former Upper Essequibo Conservation Concession in the northwest corner of the Acarai-Corentyne Corridor (CI-Guyana 2002, 2007, GFC 2006, Willink et al. 2013, Kelloff et al. 2023).	plants, fishes, mammals
2003	In November 2003, Auburn University ichthyologists Jon Armbruster, Lesley de Souza, M.H. Sabaj, D. Arjoon, N.K. Lujan, and M. Hardman surveyed fish communities along the Essequibo River, including Yukanopito Falls and Granny's Watering Hole.	fishes
2004	In May 2004, Smithsonian botanist Karen Redden collected a small number of legume specimens along the Essequibo with Wapishana experts Romeo Williams, Claudio Perry, and Ekufa Mewsha (Kelloff et al. 2023).	plants
2011–2012	Between October 2011 and February 2012, consultants carried out fieldwork for an environmental impact assessment of planned logging operations in the northernmost region of the corridor (Environmental Management Consultants 2012).	plants, invertebrates, fishes, amphibians, reptiles, birds, mammals

Nine months before the rapid inventory fieldwork, in February 2024, a search of GBIF yielded approximately 250 records inside the Acarai-Corentyne Corridor. This too is a vanishingly small number for such an enormous area, making the Acarai-Corentyne Corridor one of the most poorly sampled rainforests on Earth.

Table 3 lists seven historical biodiversity surveys carried out just outside the Acarai-Corentyne Corridor, most of them focused on what is now Kanashen Amerindian Protected Area. Additional biodiversity surveys, which contain information relevant to the Acarai-Corentyne Corridor but are not included in Table 3 because of their geographic distance from the corridor, are those carried out in the Kanuku Mountains Protected Area (Montambault and Missa 2002), the Karawaimin Taawa mountain range (Thomas et al. 2023), and Parabara (Alonso et al. 2016).

For the time being, we have rejected as dubious one other source of biodiversity data from the region: >200 records on iNaturalist that span much of the New River Triangle. All were submitted by the same user and recorded during the same month. Given that some of the photographs depict a coastal setting, they have been omitted as mapping errors.

EXPECTED SPECIES LISTS

The taxonomic teams on the rapid inventory used a number of different methods and datasets to generate lists of plant and vertebrate species expected to occur in the Acarai-Corentyne Corridor. These lists were derived from confirmed occurrences in adjacent and environmentally similar areas (see previous section), expert range maps, and modeled species distributions.

To standardize those efforts, Map of Life (www.mol.org) provided a comprehensive package of biodiversity expectations for the region. These expectations were based on Map of Life's high-resolution species distribution models (SDMs) for ~13,000 amphibian, reptile, bird, mammal, freshwater fish,

Table 3. Biodiversity surveys carried out just outside the Acarai-Corentyne Corridor, 1937–2014.

Years	Surveys	Taxonomic groups
1937–1938	Scientists led by the American Museum of Natural History sampled the Acarai Mountains as part of the Terry-Holden Expedition to British Guiana (Bartram 1939, Holden 1938, Smith 1939, Schwarz 1940).	mosses, plants, insects, reptiles, amphibians, small mammals
1993–1997	Smithsonian Institution plant collectors visited numerous sites in what is now Kanashen Amerindian Protected Area (Kelloff et al. 2011, 2023, Henkel et al. 2016).	plants
1998–2006	Ornithologists carried out a number of bird inventories in what is now Kanashen Amerindian Protected Area (Robbins et al. 2007).	birds
2006	Conservation International and partners carried out a rapid assessment of what is now Kanashen Amerindian Protected Area (Alonso et al. 2008).	ants, katydids, dung and passalid beetles, decapod crustaceans, mollusks, fishes, amphibians, reptiles, birds, and large mammals
2008	Brazilian scientists carried out a biological inventory of a site in that country's Grão-Pará Ecological Station, a few kilometers across the border from Kanashen Amerindian Protected Area (Secretaria de Estado de Meio Ambiente do Pará 2011a, 2011b, 2011c, Avila-Pires et al. 2010, Aleixo et al. 2011, Dutra et al. 2020).	plants, fishes, amphibians, reptiles, birds, mammals
2013	Botanists from Naturalis Biodiversity Center and the University of Guyana established tree plots in Kanashen Amerindian Protected Area (ter Steege et al. 2014).	trees
2014	In September-October 2014, WWF-Guyana led a Biodiversity Assessment Survey of the upper Berbice River, which studied three sites roughly 10 km north of the Acarai-Corentyne Corridor (Alonso et al. 2018).	dragonflies, damselflies, amphibians, reptiles, birds, mammals, fishes, aquatic beetles, ants, crabs, shrimps, plants

and tree species across the South American continent. The models take the form of maps showing how likely each species is to occur in every 1-km^2 pixel in South America. This is part of a standardized, global modeling workflow carried out by Map of Life since 2021, which has now generated species-level maps encompassing all of South, North, and Central America.

These SDMs incorporate the following inputs:

- Rigorous taxonomic backbones and checklists linked to globally recognized authorities (to minimize nomenclatural error);
- Quality-checked species occurrence records (points where the species is known to occur, thanks to a collected specimen, validated observation, etc.) compiled on GBIF and eBird;
- For birds, species absence records (points where the species has been confirmed to not occur);
- Expert range maps for all terrestrial vertebrate species;
- Ecoregion maps for other taxonomic groups where expert range maps are not available; and
- Environmental data layers (climate, soil, topography, productivity, etc.).

The Map of Life modeling is based primarily on a modified form of maximum entropy (Maxent) modeling introduced by Merow et al. (2016) and developed further by Map of Life. While traditional Maxent models rely exclusively on point occurrence records as the source of information about where a species occurs, this modified form (Offset Maxent) allows one to incorporate a priori knowledge about the geospatial extent of a species' distribution. For this purpose, Map of Life used both expert range maps (when available) and ecoregion range maps introduced by Pinkert et al. (2023).

Overlying the Acarai-Corentyne Corridor on these SDMs yielded a list of species likely to occur within its bounds.[1] Because of their geographic breadth and high geographic resolution, these models also provided key conservation information for the expected species—e.g., how large a species'

1 These analyses were done with a map of the study area that did not extend as far north as the Acarai-Corentyne Corridor. As a result, this analysis was carried out for an area ~10% smaller than the current polygon, with less representation of the northern lowlands. See pages 18–19.

Figure 16. A map of prior biodiversity surveys in and around the Acarai-Corentyne Corridor 1937–2014.

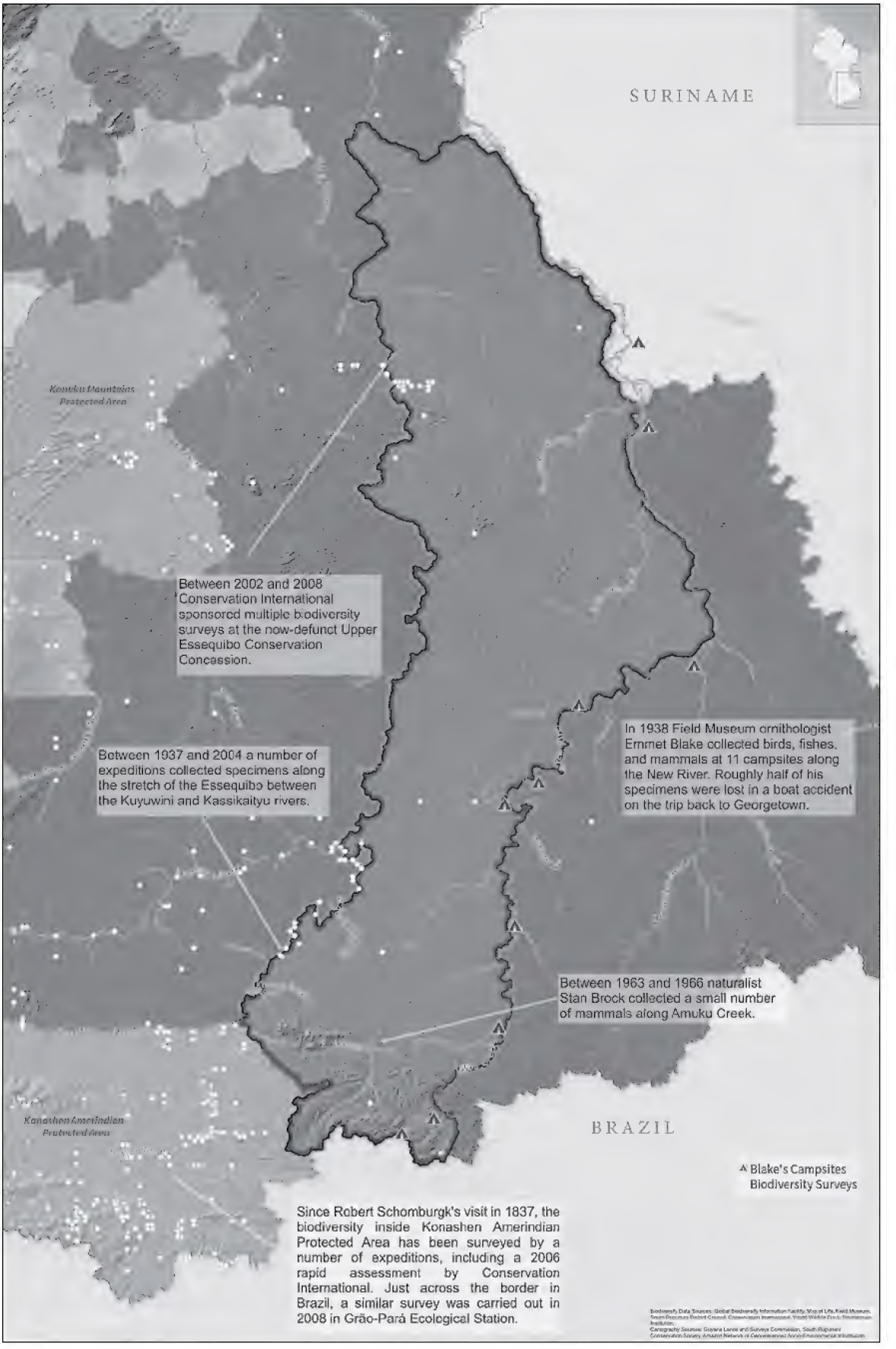

SURINAME
Kanuku Mountains Protected Area
Between 2002 and 2008 Conservation International sponsored multiple biodiversity surveys at the now-defunct Upper Essequibo Conservation Concession.
Between 1937 and 2004 a number of expeditions collected specimens along the stretch of the Essequibo between the Kuyuwini and Kassikaityu rivers.
In 1938 Field Museum ornithologist Emmet Blake collected birds, fishes, and mammals at 11 campsites along the New River. Roughly half of his specimens were lost in a boat accident on the trip back to Georgetown.
Between 1963 and 1966 naturalist Stan Brock collected a small number of mammals along Amuku Creek.
Konashen Amerindian Protected Area
BRAZIL
Blake's Campsites
Biodiversity Surveys
Since Robert Schomburgk's visit in 1837, the biodiversity inside Konashen Amerindian Protected Area has been surveyed by a number of expeditions, including a 2006 rapid assessment by Conservation International. Just across the border in Brazil, a similar survey was carried out in 2008 in Grão-Pará Ecological Station.

Table 4. Raw and validated lists of vertebrate species expected to occur in the Acarai-Corentyne Corridor.

Taxonomic group	Species expected in the region (raw SDM lists)	Species expected in the region (expert-validated lists)
Fishes	480	>400
Amphibians	102	73
Reptiles	229	79
Birds	614	>431
Large and medium-sized mammals	50	42
Bats	118	118
	1593	**>1143**

range is and what proportion of it lies within currently protected areas (Map of Life 2024).

These models are new and require expert validation. In addition to ground-truthing expected species lists in the field, rapid inventory experts from each taxonomic group validated these lists by flagging species they considered unlikely to occur and species that should be on these lists but were not. Experts found the first iteration of these models to significantly overestimate the number of species expected in the region (Table 4). This validation will help inform future iterations.

Based on this work, in May 2025 Map of Life and the Field Museum made expected and recorded species lists for the Acarai-Corentyne Corridor available on an online dashboard for the Guyanese government. We envision this as the first step towards a publicly available online resource that will display biodiversity data from the corridor—comprising not just the present rapid inventory but also prior biodiversity surveys, future inventories, and model predictions—all linked to global resources in the Map of Life platform (Jetz et al. 2012, Map of Life 2024).

REGIONAL PANORAMA AND SITE DESCRIPTIONS

Authors: Nigel Pitman, Cameron Rutt, Lesley de Souza, and Robert F. Stallard

INTRODUCTION

The Acarai-Corentyne Corridor is a 1.5 million-ha expanse of southern Guyana identified by the Guyana Protected Areas Commission as an area of interest for the country's protected areas expansion plan (see map in Fig. 2A; Bicknell et al. 2017, Government of Guyana 2022). Bounded by Guyana's longest rivers—the Essequibo and New/Corentyne—the Corridor stretches 275 km from the Acarai Mountains in the south to the lowland greenheart forests of central Guyana in the north. Along the way, four of Guyana's largest rivers are born: the Essequibo, the New, the Corentyne, and the Berbice.

This chapter provides an overview of landscape features across the corridor, a discussion of the corridor's larger geographic context in southern Guyana and neighboring countries, and in-depth descriptions of the three localities visited during the rapid inventory.

REGIONAL PANORAMA

Topography

The Acarai-Corentyne Corridor encompasses an 800-m elevational gradient, from a high of 873 m above sea level on the highest peaks of the Acarai Mountains to a low of 73 m at its northernmost tip. This gradient can be conveniently divided into three main segments—high elevations in a small mountainous area in the south, low elevations in a small area in the north, and intermediate elevations along the immense central plateau that dominates most of the corridor (see map in Fig. 23). These three segments represent different geological erosion surfaces, from the oldest in the south to the youngest in the north (see geology section below).

The majority of the Acarai-Corentyne Corridor (>70%) lies on the central segment, at elevations between 200 and 300 m above sea level (Fig. 17). This vast plateau stretches from the foothills of the Acarai and Amuku mountains in the south to a steep escarpment roughly at the latitude of Camp Jaguar, where elevation drops abruptly to a lower plateau with elevations more typical of Guyana's coastal plain (see Fig. 23). Where the Essequibo, New, and Corentyne rivers flow off of this plateau they form complex braided channels and rapids, as well as the area's largest waterfalls (Figs. 3D, 5G). Indeed, it is this escarpment that is ultimately responsible for the inaccessibility of the Acarai-Corentyne Corridor, due to the considerable barriers it creates for boats traveling up the Essequibo and Corentyne rivers.

Within each of the three segments, some smaller-scale topographic patterns bear mentioning. The divide between the Essequibo and New watersheds, which runs north-south for nearly the full length of the Acarai-Corentyne Corridor, is a prominent hydrographic feature of the vast central plateau but not a prominent topographic feature. So modest is the height of this 'spinal column' in most places that it would be quite

easy for a person to hike across it without noticing (see Fig. 23). Part of the reason is that the plateau itself is covered with thousands of modest hills, giving a hiker the perpetual impression of climbing a slope, crossing a hilltop, descending the slope on the other side, crossing a small creek, and then repeating this cycle for hours. On topographic maps of the Acarai-Corentyne Corridor, this kind of local relief creates a characteristic bumpy pattern (Fig. 4C).

Geology, soils, and climate

Geology

The Acarai-Corentyne Corridor is a geologically complex mosaic of ancient landforms developed on a basement of igneous and metamorphic rocks ranging from 1.2 to 3.4 billion years old. According to the official geological map of the country, geology in the corridor is representative of geology across southern Guyana, dominated by the ancient Kanuku Group and Kanuku and Kuyuwini formations. The geology of the northern portion of the corridor is similar to that of the Kanuku Mountains Protected Area, while that in the southern portion is similar to that in Kanashen Amerindian Protected Area. Much of what is known about the corridor's geology is based on a geological survey that is now more than 50 years old (1966–1971; see Berrangé and Johnson 1972, Berrangé 1977, and Berrangé 2015).

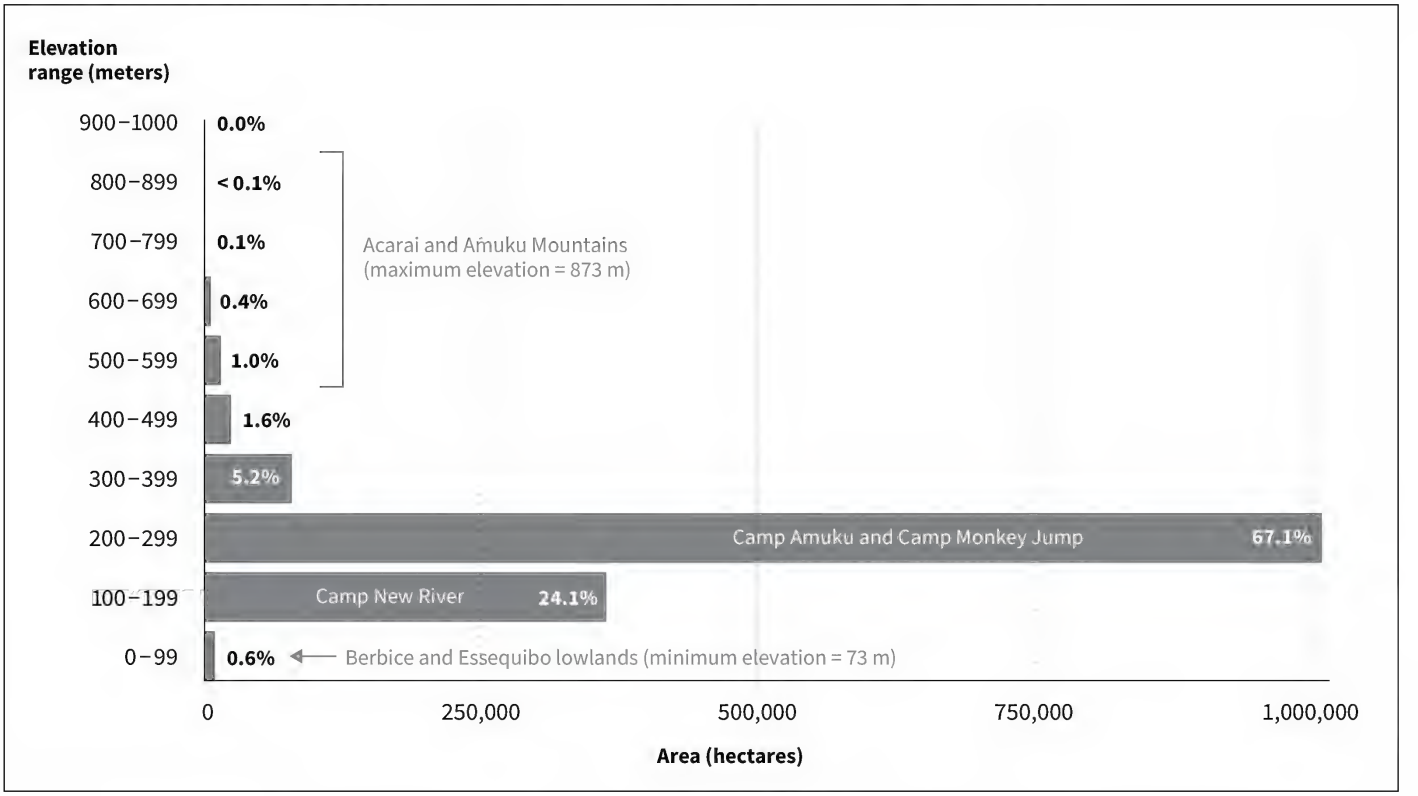
The three topographic segments described in the previous section correspond to erosion surfaces of varying ages. The southern, mountainous segment is the oldest, having been formed by erosion events dating to 60–140 million years ago. The central plateau corresponds to the 10 million year-old Kuyuwini Surface, underlain by predominately granitic bedrock ~2 billion years old. To the north, this then drops off steeply onto the much younger Rupununi (2 My) and Mazaruni surfaces (Fig. 23).

For a detailed description of the region's geology, see the *Geology* chapter on page 102.

Soils

In a map of soil texture across Guyana, the Acarai-Corentyne Corridor is dominated by loamy soils with patches of clayey soils, but no sandy or organic soils (Jiménez Espinosa et al. 2022). This was corroborated by our fieldwork, which showed a dominance of brown loamy soils in the uplands and whitish

Figure 17. Areas and proportions of the Acarai-Corentyne Corridor that fall into different elevational increments. Note the relatively tiny coverage of high elevations and the predominance of the plateau between 200 and 300 m elevation, on which our first two camps were located.



clayey soils in the floodplains. In the 80-cm deep soil cores we took during field work, both in the uplands and on the floodplains, we observed very little change in color or texture.

Brazilian maps of the immense protected area bordering Guyana to the south show a similar pattern, with 70% composed of a red-yellow argisol according to the Brazilian system of soil classification (Secretaria de Estado de Meio Ambiente do Pará 2011a). This argisol is composed of aluminum and iron oxides with high clay content in the lower layers but very low clay content in the upper layers.

While we saw essentially no white sand in the field, it is likely that very small patches occur here and there on the landscape, despite none being evident in satellite imagery. Just south of the corridor, however, satellite imagery reveals a large (~25 km^2) and well-defined patch of exposed white sand with shrubby vegetation. This is located along the Oronoque River, ~23 km SSE of the New River. We know of no visits to this striking landscape feature, which appears to be unique in southern Guyana.

Between the Acarai and Amuku mountains, some of the earliest scientists to visit the region noted a curious feature of soils in the lowlands. Brown and Sawkins (1875) write:

> *On the morning of the 2d we passed a tract of level country, for a distance of fully a mile where the surface of the ground was dotted with small hollows or pits, of various sizes and shapes in a most curious manner. These holes were usually circular, but often of elongated forms, and of from 4 to 6 feet deep each. The bottoms of some were hard, of others soft, and had no fissures. These pits covered a surface many acres in extent, that to all appearance is never wholly under water, in wet weather. The surface of the ground is a hard brownish grey arenaceous clay. Beyond these, for a considerable distance, the country is low and swampy and full of little hillocks and ridges of clay, as the above-mentioned part was full of pits.*

Similar features have been documented in French Guiana, where they are known as 'djougoun-pété' (A. Fouquet, personal communication). In his treatise on the geology of southern Guyana, Berrangé (1977) explained the natural origin of these pits, writing:

> *The laterite plateaux have circular or elliptical hollows similar to sinkholes in limestone country. These hollows may be 10 to 100 ft (3-30 m) across, up to 15 ft (4.5 m) deep and contain water during the rainy season. They are formed by seepage of rainwater through the vermicular laterite crust, with subsequent subsurface circulation leading to the removal of laterite in solution and the ultimate collapse of the crust to form a depression.*

Similar pits have been observed in recent years along the trail connecting Gunns Strip with the Kassikaityu River (J. de Freitas, P. Suse, R. Yamochi, personal communications), and in the former Upper Essequibo Conservation Concession, where they were described as "large craterlike holes filled with water" (Kelloff et al. 2023).

We observed these pits during the rapid inventory. They were especially common in the seasonally wet swamps at our first camp, where the trail passed them every few meters for several kilometers. The pits we observed were significantly shallower, however, than the largest described in the literature. They typically measured no more than 0.5 m deep. Local experts informed us that these pits filled with water during the rainy season, while the land around them remained unflooded (J. Suse, personal communication). The role these pits play in the distribution of biodiversity and the evolution of the landscape remains unclear.

For a more detailed discussion of the region's soils, see the *Geology* chapter on page 102.

Climate

There are no weather stations or river gauges inside the Acarai-Corentyne Corridor. Historically, the closest stations were at Apoteri Village, ~30 km from the northwestern corner of the area of interest, but it is not clear whether these stations are still functioning (CI-Guyana 2002). Elsewhere, the government of Guyana considers it a priority to reinstall a weather station inside the Kanashen Amerindian Protected Area (K. Dhiram, personal communication).

Despite the scarcity of local data collection, the Hydrometeorological Service of Guyana possesses high-quality information on the climate of the area thanks to modeling and remote sensing tools (Dhiram et al. 2025). Much of this information is publicly available on the Hydromet website (http://181.199.253.14/maproom/Climatology/index.html).

Rainfall is seasonal, with 4–6 months averaging <100 mm. The rainiest month is May, averaging >300 mm, while the driest months are October, November, and December (Fig. 18; CI-Guyana 2002; Dhiram et al. 2025). During our November 2024 fieldwork, we witnessed several powerful consequences of this seasonal drought (see campsite descriptions below). Regionally, dry seasons may be growing more intense. Over the last decade, rainfall in the Acarai-Corentyne Corridor has declined drastically, largely due to less rain falling during the

driest months of the year (Fig. 19; K. Dhiram, unpublished data).

Compared to rainfall, temperature shows a weaker seasonal pattern. Monthly means range between 23 and 24°C, while monthly mean maxima are highest in the dry season, ranging from 31°C (May) to 34.5°C (October).

Forest connectivity

The Acarai-Corentyne Corridor is embedded in the world's largest intact block of tropical forest, comprising much of Brazil north of the Amazon and adjacent areas in six other South American countries (Secretaria Estadual do Meio Ambiente do Pará and Imazon 2013, Watson et al. 2018). An enterprising squirrel could travel all the way from Guyana's southern border to the banks of the Amazon River—a distance of 455 km—without ever touching the ground. Traveling to the east, an even more inspired squirrel could make an even longer trip—a distance of 725 km—to the Atlantic coast of Brazil's Amapá state without encountering a significant break in forest cover.

The Acarai-Corentyne Corridor and the larger block of forest surrounding it meet Potapov et al.'s (2008) definition of an intact forest landscape: "an unbroken expanse of natural ecosystems within the zone of current forest extent, showing no signs of significant human activity, and large enough that all native biodiversity, including viable populations of wide-ranging species, could be maintained." Intact forest ecosystems are increasingly rare at the global scale and hold exceptional value for biodiversity, ecosystem services, and Indigenous peoples (Watson et al. 2018).

Figure 18. Mean monthly rainfall at a central point in the Acarai-Corentyne Corridor, showing the distinct four-month dry season during which the rapid inventory was carried out. Averages are for the years 1981–2024. Data from Dhiram et al. (2025).

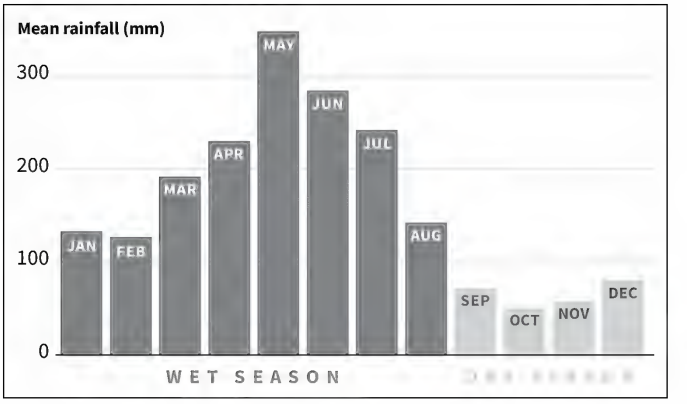
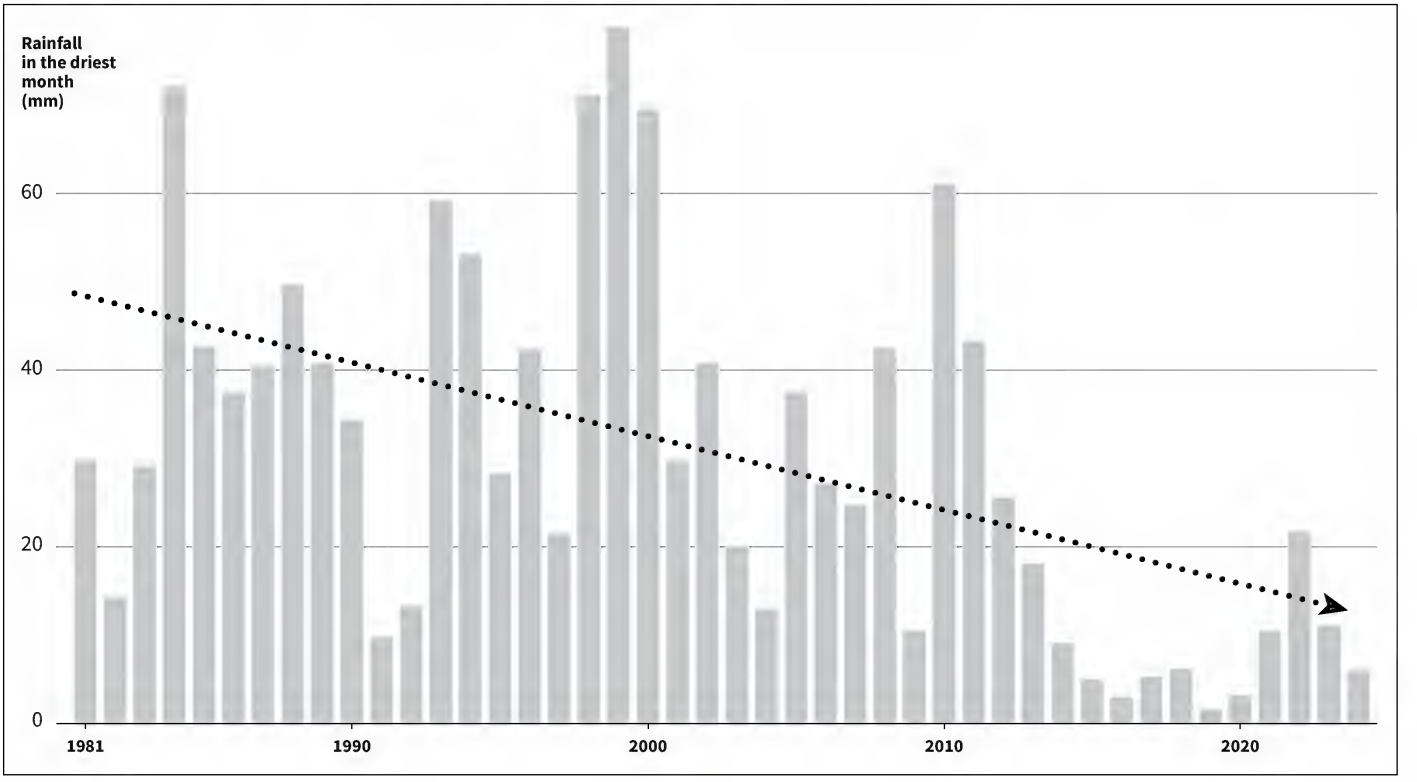


Figure 19. Rainfall in the Acarai-Corentyne Corridor for the driest month of the years 1981–2024. Note the severe decline in dry-season rainfall over this 40-year period. Data from Dhiram et al. (2025).



While we observed no deforestation in the Acarai-Corentyne Corridor, it is advancing all around the borders of the larger forest matrix (Potapov et al. 2017). The most pressing example is just north of the corridor, where a network of informal logging roads crisscrosses the forest (Alonso et al. 2018). Preventing the spread of these roads is a very high priority (Engert et al. 2025).

Two other deforestation frontiers are relevant to the corridor. One is in Brazil, 100 km to the southwest of the southern tip of the corridor, where an extensive network of roads is approaching the Guyana-Brazil border and the edge of Kanashen Amerindian Protected Area. The other, much smaller, is in Guyana, 85 km to the west of the Essequibo River, where mining in the Marudi Mountain area is driving a small but worrisome amount of deforestation. Roughly 100 km to the west of the Essequibo River, the forest transitions abruptly but naturally into an entirely different vegetation type: the south Rupununi savannas.

In the northern portion of the corridor, satellite imagery shows dozens of small clearings, some of them concentrated together and others scattered widely across the surrounding landscape. One large concentration is located ~30 km WSW of the Camp Jaguar landing strip. These are most likely not deforestation but rather natural clearings opened by a powerful windstorm.

Hydrology and freshwater connectivity

The corridor's impressive forest connectivity is mirrored by an impressive connectivity of freshwater systems. This includes >900 km of three large rivers (Essequibo, New, and Corentyne), thousands of kilometers' worth of upland and montane creeks draining the landscape, and hundreds of rapids and river islands. The corridor also contains ~10 major tributaries of the large rivers, some of which are enormous in their own right. For example, the watershed of one New River tributary—the Barrington Brown River—itself exceeds 125,000 ha in extent. Because we visited the area during the dry season, we did not directly observe a large number of water bodies that vanish when rainfall is scarce, especially small montane streams and upland creeks.

All of these aquatic systems remain entirely unstudied. During the rapid inventory, we made some cursory measurements of water temperature and pH (see campsite descriptions below). In the neighboring Kanashen Amerindian Protected Area, more detailed measurements of water attributes are likely relevant to our area (Trotz 2008). Additional studies are a high priority given the area's importance as a region of headwaters. The Acarai-Corentyne Corridor accounts for ~3% of the total Essequibo River watershed, ~12% of the total Corentyne watershed, ~44% of the total New River watershed, and 4.5% of the total Berbice River watershed.

Neighboring land uses

With a perimeter of 1166 km, the Acarai-Corentyne Corridor borders a large number of different land uses, past and present (Fig. 2B). Because the region is remote and most of its perimeters are rivers, an understanding of neighboring land uses is crucially important for developing successful long-term conservation strategies.

Kanashen Amerindian Protected Area

Waiwai residents of Kanashen Amerindian Protected Area (KAPA; Fig. 2B) were key participants in the 2024 rapid biodiversity inventory, and this report contains an executive summary in the Waiwai language (page 73). In 2004, Masakeñarî village obtained legal land title to a 625,000-ha area, which in 2007 they established as a community-owned conservation area (IUCN Management Category VI) called Kanashen (Konashen) through a memorandum of understanding between the village, the government of Guyana, and Conservation International-Guyana. In 2017, following years of advocacy by the village, Kanashen joined Guyana's National Protected Areas System as the first and only Indigenous-owned and -managed conservation area in the system.

Conservation management and decision-making for KAPA is led by the Masakeñarî Village Council, with support from Guyana's PAC and financing from the Protected Areas Trust Fund. Selected Masakeñarî village residents work as KAPA Rangers, conducting quarterly patrols and maintaining two ranger stations. The management plan establishes a zoning system for managed resource use in the eastern portion along and east of the Essequibo River, with strict nature reserve and wilderness zones in the westernmost forests which residents access infrequently but connects with the WaiWái Indigenous Territory in Brazil. The area bordering the Acarai-Corentyne Corridor falls within the managed resource use area (Zone 7).

Kanashen's biodiversity has been surveyed by a number of outside expeditions (see *Prior surveys* on page 85), most notably a 2006 rapid inventory led by Conservation International (Alonso et al. 2008).

Grão-Pará Ecological Station

Brazil's largest protected area, the Grão Pará Ecological Station, shares a 59-km border with the area of interest (Fig. 2B). Measuring 4.2 million ha, it was established in 2006 as a strictly protected park (IUCN Management Category I). Its management plan, approved in 2011, was developed in collaboration with Indigenous residents of the park (Secretaria de Estado de Meio Ambiente do Pará 2011a). While no permanent Indigenous villages are located within the Ecological Station, the area overlaps slightly (2%) with the Kaxuyana-Tunuyana Indigenous Territory to the south. Indigenous peoples living in a voluntary state of isolation have been reported in both Grão-Pará and the Kaxuyana-Tunuyana Indigenous Territory. Waiwai and Trio peoples travel through Grão-Pará while moving along trails and rivers connecting southern Guyana, southern Suriname, and northern Brazil.

The area near the Guyana border is zoned as a low-impact wilderness with the goal of protecting the high-elevation forests of the Acarai Mountains. Almost all of Grão Pará is bordered by other protected areas and Indigenous territories, making it part of a 22 million-ha block of intact forest known as the Calha Norte (Secretaria Estadual do Meio Ambiente and Imazon 2013).

A 2008 biodiversity inventory carried out by Brazilian scientists yielded abundant information from a campsite in the southern foothills of the Acarai Mountains, just a few kilometers south of the Guyana-Brazil border and of Guyana's Kanashen Amerindian Protected Area (Secretaria de Estado de Meio Ambiente do Pará 2011b, c). Plant and terrestrial vertebrate communities in the northern portion of Grão-Pará appear compositionally similar to those in southern Guyana, while fish communities are distinct, reflecting a completely different drainage (the Trombetas watershed; Avila-Pires et al. 2010, Aleixo et al. 2011, Dutra et al. 2020).

Upper Essequibo Conservation Concession

Between 2002 and 2012, Conservation International-Guyana (CI-Guyana) operated a conservation concession in an 82,199-ha area that partially overlaps the Acarai-Corentyne Corridor (Fig. 2B). Through a Timber Sales Agreement with the Guyana Forestry Commission (GFC), CI-Guyana was granted a 30-year lease to the Upper Essequibo Conservation Concession, based on a commitment to keep the timber stock standing. In addition to annual royalties and fees paid to GFC, CI-Guyana established a Voluntary Community Investment Fund to benefit three nearby communities (Apoteri, Rewa, and Crash Water). The communities could then invest these funds in local projects to compensate for any economic opportunities lost due to the concession (CI-Guyana 2013, Bernard 2014). One such project was the Rewa Eco-Lodge, built in 2005–2006, which remains a globally celebrated ecotourism destination.

The concession was managed full-time by four rangers from the local communities with support from CI-Guyana offices in Apoteri and Georgetown. Management activities were guided by four objectives: 1) document the concession's biological and cultural values, 2) mitigate threats and impacts, 3) communicate the concession's value, and 4) ensure that the concession benefited local communities and the national government (CI-Guyana 2002, 2007). A number of surveys of both timber stocks and plant and animal communities were carried out during the concession's tenure (CI-Guyana 2002, 2007, GFC 2006, Simon 2007, Willink et al. 2013, Kelloff et al. 2023), effectively making this site a 'fourth campsite' for the rapid inventory.

The upper Berbice River

Roughly 80,000 hectares in the northernmost portion of the Acarai-Corentyne Corridor are occupied by the headwaters of the Berbice River (Fig. 2A). Inside the corridor, the Berbice watershed is uninhabited and currently free of mining and forestry leases, though some areas were previously granted as logging concessions but subsequently revoked (Alonso et al. 2018, 19–20). Just outside the corridor, however, both kinds of leases are common along the upper Berbice (Fig. 2B). At least one informal logging road mapped by Alonso et al. (2018) was a mere 15 km from the border of the Acarai-Corentyne Corridor when visited in 2016. The logging road network may have expanded in the intervening years and could even have entered the corridor. As a result, this is perhaps the area of the corridor most immediately vulnerable to outside pressures. It is a high priority to visit the region and assess the road network, extractive activities, and their potential impacts on the Acarai-Corentyne Corridor.

The New River Triangle

To the east of the area of interest lies a triangular 1.4 million-ha area of Guyana located between the Corentyne and New rivers (Fig. 2B). The New River Triangle is the site of a long-standing territorial dispute dating back to the colonial era, when the administrators of British and Dutch Guiana disagreed on which tributary of the Corentyne River should form the boundary between the two territories. Suriname has long claimed this portion of Guyanese territory as its own.

'The Wapichan Headwaters'

To the west of the Essequibo lies an immense wilderness regarded as ancestral territory by the Wapishana people of Guyana and northern Brazil, who refer to it as the Wapichan Headwaters (Fig. 2B). In Guyana, the Wapishana people, represented by the South Rupununi District Council (SRDC), have been granted titled territories located along the savanna-forest boundary of the South Rupununi savannas (SRDC 2012). In recent years, the Wapishana communities of Shea, Maruranau, Awarewaunau, and Aishalton have submitted formal applications for an extension of their current titles that, taken together, would include the Wapichan Headwaters. The Guyanese government is currently weighing those requests as part of the Amerindian Land Titling Project (Government of Guyana 2022).

The SRDC and Wapishana villages have long taken an active role in documenting and monitoring the area's natural resources and cultural history, including helping lead biodiversity inventories (Alonso et al. 2016, Thomas et al. 2023), carrying out expeditions to monitor potential incursions (SRDC 2018), documenting customary uses (David et al. 2006), and mapping resources, cultural sites, and other features (SRDC 2012).

Parabara village has conducted resource and cultural use mapping and applied for land title to the area west of the Essequibo between the Kuyuwini and Kassikaityu rivers, which borders the Kanashen Amerindian Protected Area, to the south, and Acarai-Corentyne Corridor, to the east. In May 2025, the Minister of Amerindian Affairs announced that Parabara will receive title after its yearslong wait (Department of Public Information 2025), though the extent of the area was not announced and the legal grant had not occurred at the time of finalizing this report (June 2025). Wapishana and Waiwai residents of Parabara were key participants in this rapid inventory, and our report contains an executive summary in the Wapishana language (see page 77).

DESCRIPTION OF BIOLOGICAL INVENTORY SITES

During the November 2024 rapid inventory, we explored a representative sample of habitats, forest types, and water bodies at three sites in the Acarai-Corentyne Corridor. Combining our on-the-ground observations with those made in overflights and from satellite images suggests that our fieldwork sampled nearly all vegetation types, soil types, and terrestrial and aquatic habitats within the corridor. Indeed, all three of our camps allowed for intensive sampling of the vast plateau that dominates >70% of the corridor (see above and Fig. 17).

The unsampled habitats are concentrated in the northernmost tip of the corridor. Elevation is dramatically lower there because it is not part of the dominant plateau, which comes to an end around King William IV Falls (see Fig. 23). Likewise, surface geology in the northern portion of the corridor is dramatically younger. Some of this northern portion has been sampled by prior biodiversity surveys, thanks to intensive work in the former Upper Essequibo Conservation Concession managed by CI-Guyana in 2002–2012 (see above and the *Prior surveys* chapter on page 85). However, there remain large areas of the northern lowlands that contain vegetation types, watersheds, and other landscape features that our rapid inventory did not explore. These include the headwaters of the Berbice River, a large and unknown vegetation type that satellite imagery shows along that river, and a scattering of hundreds of small tree fall gaps of unknown origin.

There are a few other notable habitats and vegetation types on the landscape that we were unable to sample. One is the highest portion of the Amuku and Acarai mountains, which top out at 848 and 854 m above sea level, respectively, and harbor a number of features we did not see during the rapid inventory, such as large areas of exposed rock, caves, and waterfalls. While these areas remain a high priority for future exploration, two considerations suggest that expeditions there will not record a major new component of additional plant and animal diversity. First, areas higher than those we visited during the inventory (i.e., >714 m above sea level) account for a tiny proportion of the corridor: ~1,000 ha, or <0.1% of the total (Fig. 17). Second, a number of lines of evidence—our observations from the Amuku Mountains at Camp Amuku, geological maps, and prior work (e.g., Blake 1950, Secretaria de Estado de Meio Ambiente do Pará 2011a, 2011b)—suggest that the highest elevations in the corridor are likely to harbor similar plant, bird, and mammal communities to the highest reaches of the Acarai Mountains. Prior biodiversity surveys in the Kanashen Amerindian Protected Area did not document strikingly different plant and animal communities at the highest elevations (e.g., Robbins et al. 2007). Our experts do expect a small number of undescribed and endemic species to occur in these mountains, especially frogs and fishes (see the *Amphibians and reptiles* and *Fishes* chapters on pages 121 and 117, respectively).

Another feature within the corridor we were not able to sample are the small exposed rock formations that emerge from the surrounding forest in a few scattered locations. These inselbergs, while breathtaking in satellite images and

overflights (see Fig. 1), occupy an even smaller proportion of the landscape than the highlands, covering <0.05% of the Acarai-Corentyne Corridor (~500 ha). Most inselbergs are concentrated in the divide between the Essequibo and New rivers around the third parallel of latitude, in the vicinity of King William IV Falls. We anticipate they will harbor plant and animal communities similar to those on inselbergs explored to the west of our area, in the Rewa watershed (e.g., ter Welle et al. 2000).

Because our inventory took place at the height of an intense dry season (November, the third of four months that average <100 mm of rainfall in the region; Fig. 19) and in a time of year in which most plants are not fruiting or flowering, a number of habitats we explored look dramatically different in other months of the year. For that reason, additional biodiversity inventories during the wetter months (May–July) are a priority.

CAMP 1: AMUKU

Dates: 5–11 November 2024

Coordinates: 01°49'36.95" N 58°29'44.65" W

Elevational range: 230–714 m above sea level

Short description: East bank of the Essequibo River, 25 km N of Masakeñarî and 10 km W of the Amuku Mountains, between the mouths of the Urupiri (W. Amuku) Creek and the Kassikaityu River. Floodplain, upland, and swamp forests. Mostly <300 m above sea level, with a small sample of higher elevation forests on a single peak of the Amuku Mountains.

Administrative units: Region 9 (Upper Takutu-Upper Essequibo), Guyana

Land-use at the time of fieldwork: Forest Estate managed by the Guyana Forestry Commission

Hydrographic context: West Amuku and Essequibo watersheds

Straight-line distance from other campsites: 40 km to Camp Monkey Jump, 197 km to Camp New River

We camped on the east bank of the Essequibo River, directly west of the Amuku Mountains and a few hundred meters downriver from the mouth of Urupiri (W. Amuku) Creek (Figs. 2A, 4B, 20). Just downriver from and within sight of our camp, the Essequibo descended the Amaci (Anteater) Falls, whose gentle roar was audible everywhere in camp. Camp Amuku was 2 km up the Essequibo from the mouth of the Kassikaityu, a major west-bank tributary of the Essequibo.

We reached this site via a three-hour canoe ride down the Essequibo from the Waiwai village of Masakeñarî (25 km away in a straight line). We arrived at the Masakeñarî boat landing following a 40-minute walk from Gunns airstrip and a 2-hour flight from Georgetown. Historical expeditions to this stretch of the Essequibo took a much longer route, descending the Kuyuwini River from what today is the village of Parabara (~90 km away from our camp in a straight line), and then ascending the Essequibo (see the *Prior surveys* chapter on page 85). That route is still commonly used by residents of Parabara and Masakeñarî today (see the *Social landscape* chapter on page 170).

The northern border of Guyana's Kanashen Amerindian Protected Area (KAPA), which is also the northern border of Waiwai titled lands in Guyana, lay just a few meters from our southernmost stretch of trail at this campsite. Fifteen residents of Masakeñarî, six of them KAPA staff, were instrumental in building this camp and documenting its biodiversity, thanks to their close familiarity with this area. For example, our local experts had Waiwai names for many of the mountains and creeks around camp, and knew of at least one abandoned farm site in the immediate area. Waiwai knowledge of this landscape is described in detail in the *Local ecological knowledge* and *Social landscape* chapters of this report, on pages 159 and 170, respectively.

Across from our campsite, on the western bank of the Essequibo, lies a block of forest that has been formally requested as titled Amerindian lands by the Wapishana and Waiwai village of Parabara. Residents of Parabara did not accompany us at Camp Amuku but played an important role at our second camp (see below).

At Camp Amuku, our riverside kitchen, lab, and sleeping area were shaded by seasonally flooded forest. The inventory took place in the height of the dry season, however, and the riparian forest was so parched that walking around camp raised little clouds of dust. Local residents told us it had not rained in three months and was one of the driest dry seasons in memory. No rain fell during our visit and the Essequibo River was extremely low. Water level was about 3 m below the main floodplain and 8 m below the high water mark on the trees around camp. A visitor to this campsite in the month of May would find our kitchen tables deep underwater.

The geology of Camp Amuku appeared to rest entirely on a basement of Precambrian granite that was about 2 billion years old. On top of this granite were numerous small hills (the rounded lumps in Fig. 20), some of whose slopes were quite steep. Down by the river and along some of the streams that drained these hills, the soil was white, looked kaolinitic, and was covered by a thin root mat, an indicator of a lower nutrient status. After much consideration, this was deemed an alluvial deposit. In the uplands away from the river and streams, soils

were reddish-brown with an organic-rich surface layer and a well-developed root mat.

From camp, the main trail bore due east for 11 km, rising from the Essequibo (230 m elevation) to an unnamed peak in the western Amukus (714 m). This was a significant mountaintop in the Amukus but about 140 m lower than the highest peaks in the range, which lie farther to the east.

The first 9 km of the main trail were relatively flat, dominated by low-lying swamp forest under 300 m elevation; the last 2 km rose steeply into the mountains. At times the trail passed through boulder fields or alongside house-sized boulders, but we saw no stunted vegetation in those places. At the top of the Amukus, as well as up and down its slopes, grew a tall and mature closed-canopy forest. We built a rustic satellite camp halfway between the main camp and the mountaintop where researchers could rest or spend the night.

Three other trails formed loops starting and ending on the main trail. Each of these measured 6.7 km, for a total trail network of 31 km. Two loops explored swamp and upland forest (and a small patch of pole forest) to the north of the main trail, and one explored those habitats and a small patch of pole forest to the south of the main trail.

Water was scarce to absent on the trail system. Essentially all of the small forest creeks flowing when the trail system was built (small tributaries of the West Amuku or Essequibo) were bone-dry by the time the inventory team arrived a week later. The only visible water we encountered on the trail system were three shrinking pools in otherwise dry creek beds, each measuring no larger than 20 m^2. While these were found to harbor fish, the ichthyologists dedicated most of their effort to the Essequibo, especially the rapids.

In the vicinity of our campsite, the Essequibo River measured 70–100 m across. Its main channel was significantly warmer than the forest creeks. The highest temperature we measured was an astonishing 33°C (91.4°F), while creek temperatures were a cooler 25.6–27.9°C (78.1–82.2°F). All waters sampled at this campsite were acidic (5.3–7.0 pH) and extremely pure, meaning they had very low levels of dissolved solids.

An old cassava farm was located just upstream from camp, which allowed the team to explore forest succession in an area that was well known to local experts. Giant trees encircled the former farm area, where soils were tilled for potatoes, yams, fruit trees, and cassava, the staple of the Indigenous diet in the region. After 5–7 productive years, fallow farm sites begin to attract abundant wildlife, and this particular farm was reportedly a fine place for hunting white-lipped peccaries and spider monkeys.

In addition to a productive workplace, Camp Amuku was also a magical site whose forest and river spirits we will remember fondly: the bird-eating spider (*Theraphosa blondi*) who stood watch all night at the entrance to our hammock village; the delicate pink flowers scattered like jewels every morning by the *Lecythis corrugata* tree in our kitchen; the school of cheerful *Bryconops* fishes at the dock, waving their black and white tails in hopes we threw them a crumb; the powerful gusts of wind that periodically descended the slopes of the Amukus to shake the trees over the satellite camp at night; and the cream-colored tayra (*Eira barbara*) that strolled through camp one morning, unperturbed by the astonishment of a speechless scientist.

CAMP 2: MONKEY JUMP

Dates: 11–16 November 2024

Coordinates: 02°07'47.8" N 58°18'38.2" W

Elevational range: 215–318 m above sea level

Short description: East bank of the upper Essequibo River, at the mouth of the Monkey Jump Creek, 15 km due S of the mouth of the Kuyuwini River. Floodplain, upland, and swamp forests.

Administrative units: Region 9 (Upper Takutu-Upper Essequibo), Guyana

Land-use at the time of fieldwork: Forest Estate managed by the Guyana Forestry Commission

Hydrographic context: Monkey Jump, Essequibo, Xapika, and New watersheds

Straight-line distance from other campsites: 40 km to Camp Amuku, 153 km to Camp New River

Our second camp was situated a day's journey downriver by outboard-powered dugout canoes (Figs. 2A, 4C, 21). Although the first two camps were 'only' 40 km apart as the fruitcrow flies, the sinuous nature of the Essequibo River meant that we covered twice that distance to get there (~83 km). This included carefully threading three sets of rocky rapids—Amaci (Anteater) Falls, Yawanapi Falls, and Kunurima (Red-tailed Fish) Falls—each of which necessitated that our entire crew disembark. In contrast, without stops and distractions, an experienced boat crew during the dry season could probably traverse this leg in 5–6 hours' time. Despite the long journey and multiple rapids, the elevation at Camp Monkey Jump was just 15 m lower than at Camp Amuku (215 m above sea level).

Camp Monkey Jump is sandwiched between two important west-bank tributaries of the Essequibo River: the Kassikaityu,

immediately below Camp Amuku and, even farther downriver, the Kuyuwini River. Twelve residents of the Wapishana and Waiwai village of Parabara helped construct this camp and four of them rejoined us for the actual inventory. Meanwhile, although three residents of Masakeñarî had to return after the first camp, nine members continued to assist us at Camp Monkey Jump. In all, the camp housed 40 people for four days, as our stay was cut short by complicated flight itineraries and the need to travel as a unit through the rapids. We left this camp early on the morning of 16 November.

Located at the mouth of the Monkey Jump River, this region has long served as a crossroads for Indigenous peoples: those traveling within Guyana, as well as those traveling to and from Brazil and Suriname. Using the Monkey Jump River and a mirror-image tributary of the New River—the Xapika or 'Found Hat' Creek in Waiwai—allows canoes to partially bridge the divide between these two large rivers. A long one-day walk is then needed to cross from the Xapika Creek to the Monkey Jump. Different Waiwai trails have been used to secure passage between these two great river systems since 1985, and our longest trail paralleled the most recent one. A history of movement routes in this area is described in detail in the *Social landscape* chapter of this report, on page 170.

Dry weather continued at our second camp, adding to an already extreme El Niño-induced dry season. Our string of nonstop sun and blue sky finally came to an end, but threats of rain remained idle and no measurable rainfall events occurred while we were at camp. Water levels were so low that our local experts from Parabara, who had come by way of the Kuyuwini, had to return via the Kassikaityu instead. Indeed, we were able to venture ~80% of the way across the Essequibo on foot before finally reaching a deep western channel that forced one to swim. We did not measure local water levels at Monkey Jump, but the much wider berth of the Essequibo here likely would have confounded direct comparisons with those from the first camp.

With boat access to the Monkey Jump River clogged by downed trees, the entire journey across the watershed divide had to be done by foot. This was accomplished via a 16.2-km main trail with a satellite camp constructed at the halfway point (8.4 km; Fig. 21). Two kilometers further (~10 km from camp), the divide between the Essequibo and New watersheds was not a topographically striking feature. Indeed, its elevation was barely higher than that of the surrounding hilltops. The habitat at the divide, however, was markedly different from the mature upland rainforest we saw elsewhere at this camp, with some exposed rock and stunted forest, including a species of large terrestrial cactus. During our visit, this divide also featured moisture, moss, and mosquitoes, seemingly indicating poor drainage or recent, isolated rainfall. The fish and eDNA teams primarily took advantage of the unique opportunity to sample within the New River Basin on the east side of the divide.

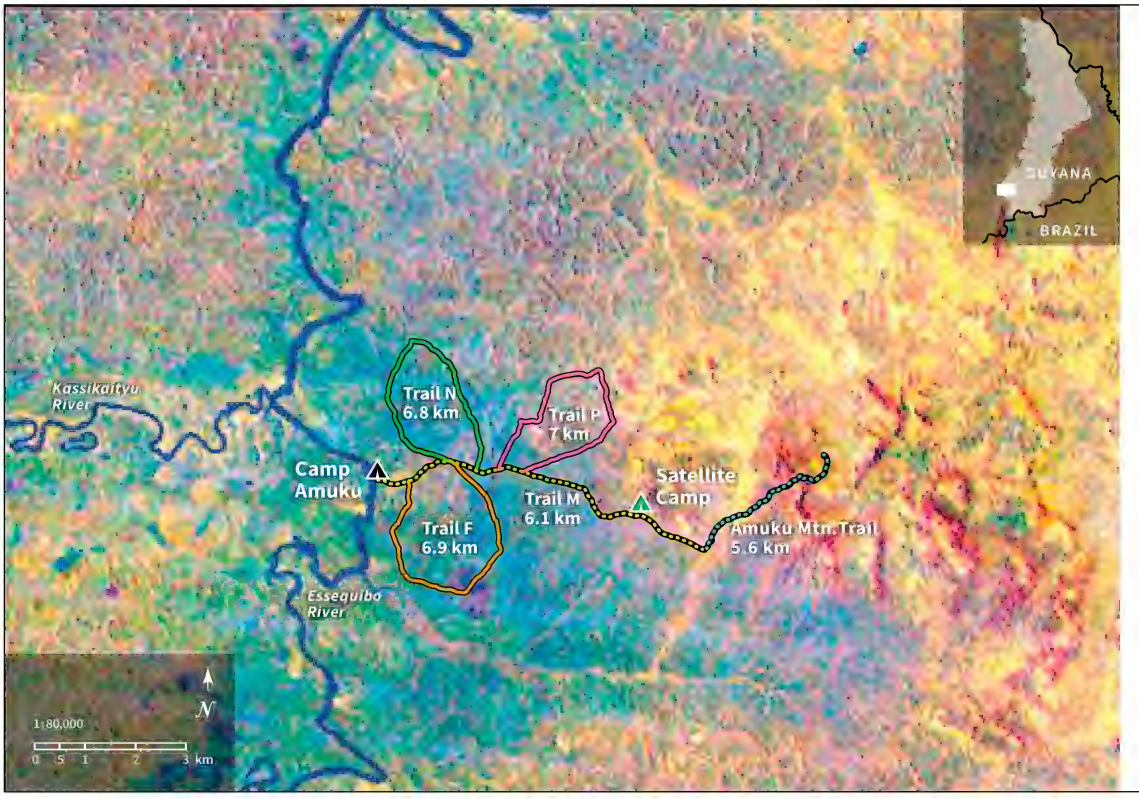
Steep, hilly terrain tested our fitness and endurance at Camp Monkey Jump. Departing from the camp to the southeast led one through a (dry) seasonally flooded forest for the first ~1 km. At 700 m and 1 km from camp, two loop trails commenced, which began in flooded or transitional forest but concluded in upland forest. These trails covered 6.3 and 7.9 km, respectively, for a total of 30.4 km of trails at this camp.

The geology of Camp Monkey Jump appeared to rest on the same granite basement as that of our first camp. On top of this were again numerous small hills, with even more obvious rounded lumps in Figure 21. The slopes of many were quite steep. Soil patterns also looked much the same as those of our first camp.

In stark contrast to Camp Amuku, water was in relative abundance here, with numerous flowing streams bisecting the trail system. Rather than reflecting significant landscape differences, however, this may simply have been the result of a few large rainstorms hitting Camp Monkey Jump and not Camp Amuku over the previous month. In any event, the abundance of water on the trail system enabled the fish and eDNA teams to effectively explore inland microhabitats rather than being restricted to the main river channel. Water temperatures here were slightly cooler than at our first camp, in both the Essequibo River (32.0–32.1°C; 89.6–89.8°F) and smaller streams (24.9–26.9°C; 76.8–80.4°F). The stark contrast between the warmer river and cooler creek waters could be felt immediately while bathing at the juncture of the Monkey Jump and the Essequibo. As at our first camp, pH ranged across a very narrow set of values (5.39–6.88). Conductivity was low to very dilute, indicating pure water with little to no dissolved solids.

Camp Monkey Jump afforded us some of our most memorable vistas, including a commanding view of the river and a large sandbar, complete with tapir (*Tapirus terrestris*) tracks; the unique opportunity to watch a full moon both rise and set over the Essequibo River; a pristine pocket of open *Mauritia* palm swamp nestled into an upland rainforest landscape; not to mention a jaguar (*Panthera onca*) that sauntered through camp the night before our team's arrival, a giant anteater (*Myrmecophaga tridactyla*) that briefly approached a team of spellbound researchers, and a trio of curious curassows (*Crax alector*) that visited an occupant at

Figure 20. Trail system at Camp Amuku with a false-color satellite image as a base map.
For additional maps of this campsite see https://doi.org/10.5061/dryad.m0cfxppg5.



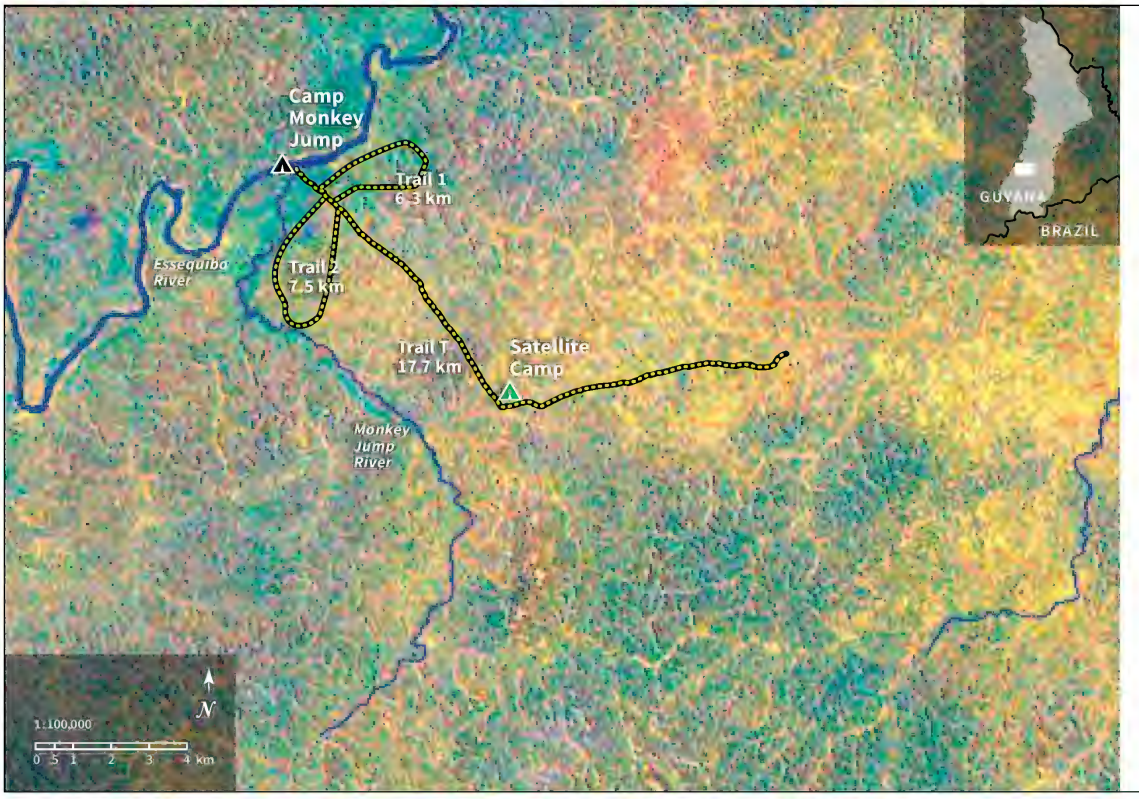
C1: Camp Amuku

▲ Lat: 01° 49' 36.95" N
Lon: 58° 32' 33.8" W

▲ Lat: 01° 49' 13.3" N
Lon: 58° 29' 44.65" W

Source: ALOS PALSAR 2011, Vandoninck 2009

Figure 21. Trail system at Camp Monkey Jump with a false-color satellite image as a base map.
For additional maps of this campsite see https://doi.org/10.5061/dryad.m0cfxppg5.



C2: Camp Monkey Jump

▲ Lat: 02° 07' 47.8" N
Lon: 58° 18' 38.2" W

▲ Lat: 02° 04' 27.9" N
Lon: 58° 15' 47.1" W

Source: ALOS PALSAR 2011, Vandoninck 2009

Figure 22. Trail system at Camp New River with a false-color satellite image as a base map. For additional maps of this campsite see https://doi.org/10.5061/dryad.m0cfxppg5.

our camp bathroom.

CAMP 3: NEW RIVER

Dates: 17–24 November 2024

Coordinates: 03°19'10.89" N 57°36'51.79" W

Elevational range: 140–216 m above sea level

Short description: West bank of the New River, 3.5 km W of Camp Jaguar military base, 5 km S of the Corentyne River, and 2 km upriver from the mouth of the Barrington Brown River. Upland, floodplain, swamp, and vine forests.

Administrative units: Region 6 (East Berbice-Corentyne), Guyana

Land-use at the time of fieldwork: Forest Estate managed by the Guyana Forestry Commission

Hydrographic context: New, Barrington Brown, and Corentyne watersheds

Straight-line distance from other campsites: 197 km to Camp Amuku, 153 km to Camp Monkey Jump

For seven nights, our team camped on the west bank of the New River, a half-hour canoe ride from the military base at Camp Jaguar, operated by the Guyana Defence Force (Figs. 2A, 4D, 22). This camp was located 5 km to the south of the main course of the Corentyne River, of which the New River is a major tributary. The confluence of these two rivers is exceptionally complex. As it approaches the Corentyne, the New River splinters into 20 different channels ranging in size from a few meters across to 90 m wide, most of these channels punctuated by rocky rapids. It was on the westernmost bank of this braided maze that our camp was located. According to the 2005 base map of Guyana (Guyana Lands and Surveys Commission), our field kitchen was a few steps from the Guyana-Suriname border and the island facing us was Surinamese.

We reached this region on a 55-minute chartered flight from the airstrip at Gunns to that at Camp Jaguar. Flying into this airstrip required military clearance, and, to our knowledge, we were the first scientists to visit this area in many years. From the Camp Jaguar airstrip, the team descended a tangled maze of New River channels for 35 minutes, zigzagging from one channel to the next aboard dugout canoes, even reversing course at times, briefly traveling upstream, before reaching our camp. The rocky river landscape is interspersed with large granite boulders and aquatic vegetation decorates the plethora of rapids, easily visible

through the crystal-clear waters. The riverside vegetation here was festooned with fruits and flowers, in marked contrast to the scarcity of fertile material everywhere else we sampled during the inventory.

In contrast to our two camps on the Essequibo, which were established on the broad floodplains of that river, our main camp here was in upland forest that rose directly from the boat landing, itself shaded by the canopy of an elegant wild cashew tree (*Anacardium* sp.). Farther uphill, a giant Brazil nut tree (*Bertholletia excelsa*) stood in the center of camp, dropping its white-and-yellow flowers and the occasional cannonball-sized fruit in our midst. This was also the lowest elevation we visited during the rapid inventory (140 m), roughly 100 m lower than our first two camps (Fig. 23). This campsite was still, however, >60 m higher than the lowest elevation in the Acarai-Corentyne Corridor.

We explored a total of 18 km of trails at this camp (Fig. 22). The primary trail continued upslope from camp, traveling through mature upland forest for ~2 km before reaching the lower reaches of the Barrington Brown River. This poorly explored watershed, named for the Canadian geologist who visited the area in the late 1800s (Brown and Sawkins 1875, Brown 1876), accounts for nearly 10% of the Acarai-Corentyne Corridor. One trail explored 4.1 km on the west bank of the Barrington Brown, others crossed the interfluve between the Barrington Brown and New rivers, and another followed the west bank of the New River for ~2 km before looping back towards camp. Roughly half of the trail system passed through mature upland forest. The remainder explored low-lying forests characterized by a very strong (yellow) signature in the false-color satellite imagery (Fig. 22). Most of this proved to be low-canopy forest with a large number of lianas and vines, a large component of secondary species, and small patches of *Guadua* bamboo (Fig. 6D). Small patches of swamp forest dominated by stands of *Euterpe* palms were also present.

Camp New River was 4.7 km from the Waiwai and Trio community of Cashew Island (Kasuela), which is located just upstream from Camp Jaguar. Residents of the village took a leading role in building the campsite prior to the team's arrival and an active role in the research during our visit. Given their mastery of navigating up and down the treacherous and confusing rapids of this braided river, we would never have reached this camp without their guidance.

The New River's remote forests and rivers have for centuries been a pathway of movement for Indigenous communities in Suriname, Guyana, and Brazil, and several lines of evidence suggest that our campsite had a history of human use and occupation (see the *Social landscape* chapter on page 170 for details). For example, the boulder at our landing was pockmarked in several places by smooth indentations where stone tools had been sharpened. A grove of perhaps a dozen large Brazil nut trees grew within a few minutes' walk of camp even though the species was not common anywhere else on the trail system.[2] Within view of our dining room table, a wild manioc vine (*Manihot* sp.) grew. Lastly, according to the 1-ha tree inventory carried out at this campsite, the tree community nearest our camp included an unusual frequency of taxa associated with rich soils (e.g., *Guarea*, *Trichilia*, *Inga*).

The bedrock at New River Camp was especially ancient, part of the 3.1–3.4 billion year-old Kanuku Complex. Soils were similar to but richer than the other camps, as indicated by a near-absence of root mat and higher stream conductivities (see the *Geology* chapter on page 102). Rocks were encountered everywhere, along rivers and in soils. Both the New and Barrington Brown rivers were very pure and slightly acidic.

The rapids on the New and Barrington Brown rivers also showcased a peculiar geologic feature: a widespread conglomerate (pebbles and cobbles bound by a cement of manganese dioxide into a solid rock). The conglomerate, in turn, fills the gaps between boulders in the rapids much like construction concrete (Figs. 5X,Y). The rapids, and therefore base level, may be stabilized and perhaps even growing due to the accumulation of these conglomerates over time. Andira Falls upstream from Cashew Island on the New River featured a very large boulder, 3 m in diameter, balanced on a pedestal of this conglomerate.

We saw some indication of more modern impacts as well. Just over 2 km from our camp, a depot of old barrels stood surrounded by a scattering of cans and bottles. Local experts told us this was the remains of an old camp established by the Guyana Defence Force around the time of its 1969 operation to take control of Camp Jaguar.

Dry weather persisted at Camp New River for the first few days, until one evening we at last had a torrential downpour (~1 hour). Even before the rainstorm, this camp was significantly wetter than our camps along the Essequibo, with low-lying areas still muddy and forest streams still flowing. As at the other camps, we measured the lowest water temperatures in the forest interiors (24.6°C; 76.3°F) while the warmest were in the large river (32.5°C; 90.5°F). Acidity varied from a pH of 5.1 to 7.13.

2 The Brazil nut grove we saw corroborated an observation made 153 years earlier by one of the first western visitors to the area, Canadian geologist Charles Barrington Brown, who wrote: "Upon the borders of the New River and main Corentyne, above the last-mentioned fall, we met with large groves of Brazil-nut trees" (Brown 1876, 348).

GEOLOGY, HYDROLOGY, AND SOILS

Author: Robert F. Stallard

Conservation targets: A flat regional pediplain having pure water vulnerable to pollution, where the concentration of dissolved and suspended solids is universally low; easy-to-erode soils and sediments covered in some places by a root mat that limits erosion and retains nutrients necessary for plants and animals; certain combinations of water regime, substrate, and topography that support distinct environments; the deposition of conglomerates cemented by manganese dioxide which in some rapids may also be important to channel stabilization

INTRODUCTION

The Acarai-Corentyne Corridor comprises ancient landforms developed on a bedrock of plutonic igneous and metamorphic rock ranging from 1.2 to 3.4 billion years old. Erosion has formed a series of at least five stacked erosion surfaces (pediplains) in our study area (McConnell 1968). The two oldest, in the south, are the highest and least extensive. The plateau that covers 70% of the corridor corresponds to the 10 million year-old (My) Kuyuwini Surface, underlain by predominately granitic bedrock ~2 billion years old. It drops off steeply to the west into the Rewa River valley and steeply to the north onto the much younger Rupununi (2 My) and Mazaruni surfaces (Fig. 23).

Southern Guyana is at the heart of the Guiana Shield which forms the bedrock basement north of the Amazon Trough and east of the Orinoco River Valley (Berrangé 1977, Gibbs and Barron 1983, 1993). The Guiana Shield and its counterpart south of the Amazon Trough, the Brazilian Shield, form the bedrock core upon which South America was constructed. The Acarai-Corentyne Corridor contains this ancient geology. The shield was assembled from various crustal blocks, sutured by mountain building (orogenies) that may each have been as dramatic as the Andes. Rocks include sediments, which were buried to great depth, faulted, sheared, folded, even partially melted, multiple times. Subsequent uplift and erosion brought these rocks to the surface. Because of the numerous blocks that have a long history of multiple deformations, there are few rules of thumb for mapping the geology on many of these landscapes and how these rock units may relate to the plants and animals that live on top.

Most of the rocks of the Guiana Shield contain minerals that formed under great pressure and high temperatures. Much of the original water and other volatiles (such as carbon dioxide and sulfur) have been driven out (this process may help create ore bodies), and the result is a bedrock that weathers quite slowly unlike the younger bedrock of sedimentary and igneous landscapes, where chemical weathering and physical breakdown is, in part, aided by water and other volatiles. These rocks also weather to conventional clays. A common term for this type of bedrock is 'hard rock.'

Weathering and erosion on the Guiana Shield

Landscape-scale erosion on the Guiana Shield does not proceed in the style that North Americans and Europeans envision (i.e., Davis-style erosion): rivers cut into uplands, valleys deepen, then valleys widen, hillslopes flatten, and eventually the landscape is flat. The style of erosion seen on the Guiana Shield was described by the South African geomorphologist Lester King (1956, 1957, 1967) and subsequently refined by many others including McConnell (1968), Aleva (1979, 1984), and Stallard (1988).

The concept of 'base level' is important to understanding erosion at all inventory sites. Sea level moves up and down through the influence of plate tectonics, local uplift, and the formation and retreat of continental glaciers. The base level on an erosion surface represents a nick point, where the waterfalls and rapids start tumbling down to a lower level. No landscape above the nick point can erode below that elevation.

In King's model, initial slopes are formed along the coastlines at the edges of uplift (or of sea-level lowering) and the sides of large penetrating river valleys. These represent drops in base level. Slopes then evolve into steepened equilibrium forms which separate the old erosion surface from an incipient new surface. As time proceeds, these slopes undergo parallel retreat into the older surface, which is consumed, while the younger surface is extended. The loss of crustal mass makes the crust, which is floating on the Earth's mantle, lighter and it is uplifted (epeirogenic uplift). The steep slopes are the locus of most of the erosion and the remaining terrain would remain flat, being drained by rivers having little erosive capacity. The end product is a pediplain, a surface where the bedrock is flat and sometimes soil covered. The process (erosion, terrace formation, epeirogenic uplift) is repeated with more sea-level drops. In the Davis model, no remnants of previous surfaces can exist. In King's model, however, successive erosional levels can remain stacked and can even actively expand through parallel retreat into the still older surfaces long after the initiating change in base level has been superseded. At least five such surfaces have been identified in Southern Africa and the Guiana and Brazilian

Shields. The surface names and estimated ages used here come from Berrangé (1977).

Soils continue to develop on each level. Commonly soils with conventional clays (alumino-silicate minerals) form containing mostly kaolinite (a simple alumino-silicate clay) and some oxides and hydroides of iron (which impart yellowish to orangish to reddish colors). Eventually, bauxite forms (made of gibbsite, an aluminum hydroxide) or laterites form (mostly iron oxides and hydroxides). Before bauxites or laterites form, kaolinite must be degraded and quartz dissolved. The highest grades of bauxite are found on the highest and oldest pediplains (Aleva 1979, 1984).

Weathering and erosion on the shield are very slow processes (Stallard 1988). These processes involve transport off the top of the soil in the case of physical erosion and from throughout the soil profile in the case of chemical weathering and erosion. Chemical weathering occurs wherever water interacts with minerals, but it is most rapid near bedrock where minerals are unweathered to partially weathered. Weathering rates are maximized in soils of intermediate thickness because water is retained in the profile and sinks down to bedrock without bypassing the bedrock in lateral flow paths. In thinner soils and on steeper slopes water moves away from the weathering zone too rapidly. In thick soils and waterlogged soils, water bypasses the fresher minerals and cracks.

Typically, bedrock is not a solid mass; instead, it is cracked (faulted and jointed) and water penetrates into the unweathered rock through these cracks. The weathering works into the fresh rock from the ever-widening cracks leaving a core of unweathered rock. These cores are found in place in soils and are referred to as core stones. With the additional reactive surfaces offered by core stones, chemical weathering can be more rapid.

As often happens with erosion, the effects of present processes erase much of what happened in the past, and a precise landscape history cannot be reconstructed. Nevertheless, drainage divides and large river channels entering onto erosion surfaces probably shift slowly because these features are controlled by base level. River piracy, where one river captures the headwaters of an adjacent river by eroding across a divide, may be a particularly important process that leaves traces. The classic example from Guyana is the proto-Berbice river which is thought to have originated in Brazil, only to have its headwaters captured by the Branco River, sending these waters to the Amazon, while its lower course was captured by the Essequibo (McConnell 1968). The Rupununi, Potaro, Mazaruni, and Wenamu-Cuyuni Rivers all have valley forms and Z-shaped courses that reflect these captures.

METHODS

I visited three sites in the Acarai-Corentyne Corridor on 5–24 November 2024. For more details on the study sites see Fig. 4 and the *Regional panorama* chapter on page 89.

Fieldwork during the rapid inventory focused on areas along the trail systems (by foot) and along the stream and riverbanks at each camp (by foot and boat). My aim was to record distinctive features and transitions along the team's route. Distinctive features included landforms, streams, soil zones and transitions, vegetation zones and transitions, erosional features, and outcrops. Among the characteristics examined were topography, soil, appearance of leaf litter and root mat, and water properties.

For soils and bedrock, color (Munsell 1954) and texture (Appendix 1B in Stallard 2005) were sometimes observed, but only outstanding transitions along trails or boat rides were noted. Stream sediments, bedrock, and soils were occasionally sampled for future reference. If possible, these observations along with measured pH and conductivity of stream water were connected to geology.

To describe drainages and water chemistry in the region, I examined as many streams as possible at each campsite. The following data were recorded: geographic location, elevation, current speed, water color, streambed composition, bank width, and bank height. For streams, water specific conductivity, pH, and temperature were measured with two waterproof field-testing kits by Apera Instruments, AI209 pH and temperature tester and AI316 pH, electrical conductivity, and temperature tester. I measured pH, electrical conductivity (EC), and temperature *in situ*. Water pH was also measured using ColorpHast pH strips covering four ranges (0.0–14.0, 2.5–4.5, 4.0–7.0, and 6.5–10.0) if problems were suspected (there were none). Two 30-mL samples of water were collected at each site, one to determine suspended solids and the other to remeasure pH and conductivity in Georgetown. The match between field data and hotel data was good. For select samples, two 125-mL bottles were collected for a comprehensive analysis of major constituents and nutrients. These samples were sterilized, in the field, using ultraviolet light in a 1-L wide-mouth Nalgene bottle using a Steripen. The samples were stored in full shade to limit temperature variation and exposure to light. Suspended-sediment concentrations were measured by weighing air-dried (105°C) filtrates (0.2-micron polycarbonate filters; Nucleopore) of known volume water samples.

Including the present inventory, 11 rapid inventories have now used conductivity and pH to classify surface waters in

greater Amazonia (Stallard 2005, 2006, 2007, 2011, 2013; Stallard and Zapata-Pardo 2012; Stallard and Lindell 2014; Stallard and Crouch 2015; Stallard and Londoño 2016; Stallard et al. 2021). The use of pH (pH = -log(H^+)) and conductivity to classify surface waters in a systematic way is uncommon, in part because conductivity is an aggregate measurement of a wide variety of dissolved ions. When examining dilute waters, and the two parameters are graphed in a scatterplot, the data are typically distributed in a boomerang shape (see Fig. 24). At values of pH <5.5, the seven-fold greater conductivity of hydrogen ions compared to other ions causes conductivity to increase with decreasing pH. At values of pH >5.5, other ions dominate, and conductivities typically increase with increasing pH. In previous inventories, the relationship between pH and conductivity was compared to values determined from across the Amazon and Orinoco River systems (Stallard and Edmond 1983, Stallard 1985, Edmond et al. 1995); here for comparison we use previous data from the Guiana and Brazilian Shields (Fig. 24).

To track location in the field I used a Garmin GPSmap 62stc, which works well under forest canopy and allows one to record reasonably complex names and notes for each waypoint, georeference photos, and review trail profiles once the track is stored. Caution must be used because some elevation variation is caused by atmospheric pressure changes. For this inventory, a new field-mapping tool was deployed: onsite GPS maps using an iPhone (model 13 Pro Max) and the application Gaia GPS. A fine-scale topographic map of the region was downloaded prior to going into the field; this appears to have been developed by Gaia GPS using a high quality digital elevation model (DEM). Tracks and waypoints can be generated in the field or added to the map prior to or after use in the field.

I used a number of methods to study topography. A synthetic-aperture-radar DEM maps the canopy top, not the ground surface, which complicates the derivation of drainage networks. Accordingly, the DEM must be conditioned to ease the determination of drainage networks. This conditioning was done in GRASS 7.8 (https://grass.osgeo.org/) using a newer algorithm called r.hydrodem. A problem with derived stream/river networks is that some of the depressions they show are real (lakes and wetlands) but most are not. Conventional GIS creates a freely draining network (such that water drains off all the DEM topography) by digitally filling all depressions. This creates an unrealistic stream network with a lot of straight stream segments. The algorithm r.hydrodem conditions differently. In one mode, it excavates narrow channels between small depressions and fills depressions that are too deep to excavate up to a specified size. Alternatively, it uses excavation and filling to make a freely draining map. In this second mode, there is dramatically less filling than for the conventional GIS approach. After conditioning, the river drainage network was derived using r.watershed and r.stream.extract which use a least-cost algorithm to derive a best flowpath (Metz et al. 2011). The resulting conditioned DEM and derived stream networks were passed into Global Mapper 21.0 (http://www.bluemarblegeo.com/products/global-mapper.php) to develop a final shaded relief map with drainage networks and trail systems. The derived drainage network was also used to produce all maps prepared during the write-up period of this inventory.

RESULTS

Essequibo River between Masakeñarî and Camp Amuku (5 and 17 November 2024)

This stretch of the Essequibo River had numerous islands, peninsulas, and bank exposures of granitic rock and some outcrops of metasediments and perhaps metabasalts. Most of the granite forms low hump-like islands and bank exposures, and some core stones measuring 0.5–4 m. There were three large rapids: Kanashen, Kanaiyu, and Biloku.

A special feature of this segment of the river is that off the left bank near Masakeñarî is the Essequibo's only well-developed oxbow lake between Masakeñarî and Square Nails Falls. The sediments exposed between the oxbow lake and the Essequibo must be of relatively recent fluvial origin. From the boat, these looked much like the white riverbank sediments that we saw all along the river (see below).

Camp Amuku (5–11 November 2024)

Camp Amuku was located on the right bank of the Essequibo River about 1 km downstream from the confluence of the Urupiri Creek (also known as West Amuku Creek). The camp was 500 m upstream from Watu Falls, a rapid with a 1–2-m drop, and another 3 km upstream from the left-bank confluence with the Kassikaityu River (long, slow-flowing, sandy). During our visit the Essequibo was at a low flow, with extensive exposed bedrock in its channel, especially near rapids. The camp was elevated about 3 m above water level. According to one of our guides (Cemci Suse) the Essequibo rises about 8 m here. This is similar to the rise recorded by the Brazilian Takutu river gauge just across the Brazil-Guyana border at Lethem.

Masakeñarî, Camp Amuku, and Camp Monkey Jump lie on the somewhat dissected Kuyuwini Erosion Surface (30 My)

of about 250 m elevation, higher to the south (Fig. 23). The elevation of the Essequibo River in this stretch (210–215 m above sea level) defines a bedrock level that we see as the vast rock exposures along the river. Away from the river there appears to be ~40 m of soil on top of the bedrock, forming numerous small hills separated by small stream valleys.

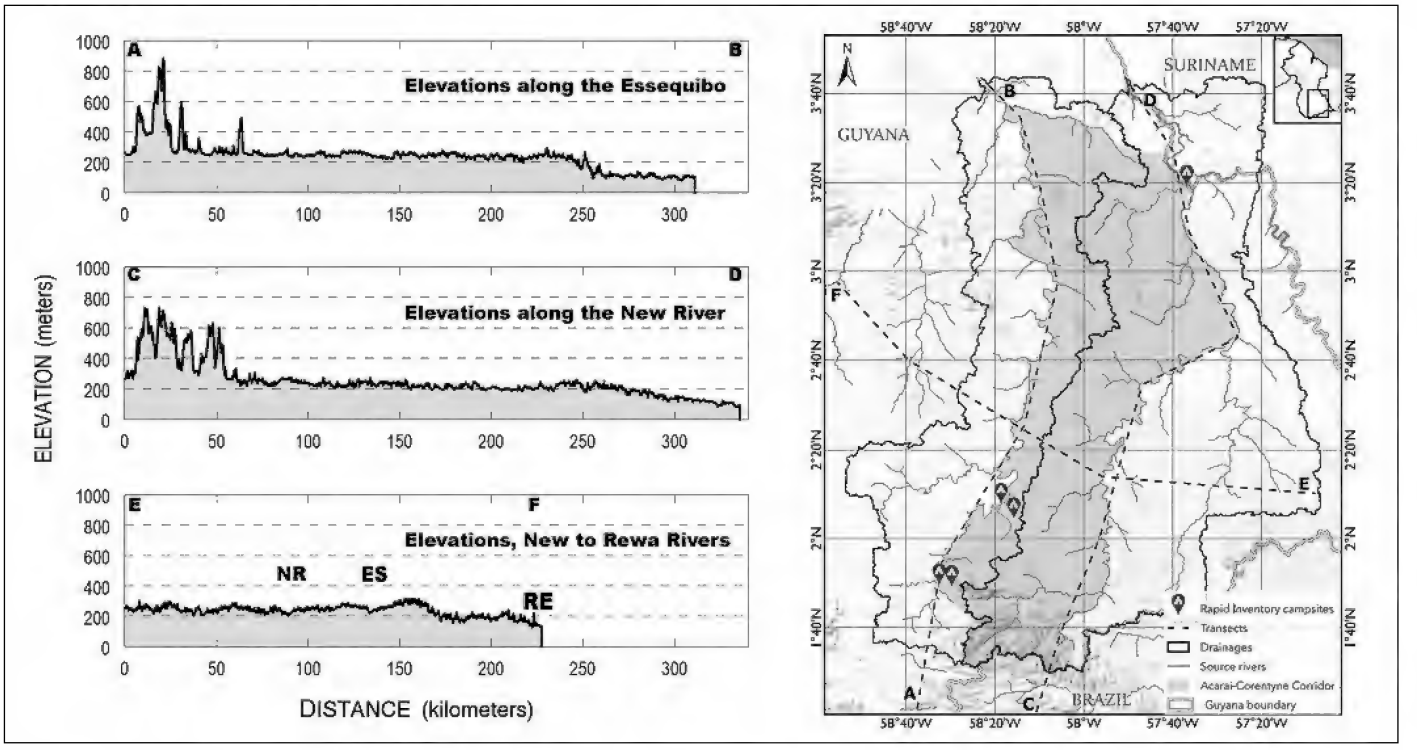
Around camp itself, the soil was a massive crumbly white material. It is most likely kaolinite. There was some rusty staining, especially near the bottom, which is typical of the oxidation of reduced iron in soil waters. The main trail and the beginning of Trail F were on this material (Fig. 20). The topmost soil horizon was brown from an abundance of organic matter. There was a thin and discontinuous root mat, and leaf litter was present but not particularly thick. The surface was hummocky on slopes, presumably from a long history of tree falls and animal burrows. There were flat areas near the Essequibo itself and some swamps where it appears there is occasional flooding. This white layer was about 3–5 m thick.

Essentially all the iron has been leached out of the layer. It would be hard to say whether the leaching was promoted by the lack of oxygen in soil water whereby insoluble Fe-III is converted into soluble Fe-II or whether dissolved organic matter has favored the dissolution of iron over aluminum or kaolinite. If a lack of oxygen has promoted loss of iron, it would do the same for manganese.

The soils on hills were reddish brown. The topmost soil horizon was a richer brown from an abundance of organic matter. There was a thicker and near-continuous root mat. The leaf litter was generally thick. The surface was hummocky everywhere, presumably from a long history of tree falls and animal burrows. The reddish-brown soil is consistent with the presence of iron oxyhydroxides. A reddish color seems to be universal for the top part of the soil. However, as we traveled along the river in the boats, the precise reddish-brown color changed, indicating either some original bedrock control or control by vegetation or moisture history.

There was no clear way to establish whether the brown soil was adjacent to the white soil (implying a fluvial origin of the white soil) or on top of the white soil (implying a more complicated history of soils on the landscape, because white soils cannot form below brown soils owing to the difficulty of removing iron from the presumably brown ancestral white soil). Either iron oxyhydroxides are not leaching into the white soil or the processes that remove the iron from the white layer are still active. This reddish layer cannot be forming from the white layer, because the red layer requires iron. It therefore

Figure 23. Right: a map of southern Guyana with the Acarai-Corentyne Corridor highlighted in gray. Left: To illustrate the flatness of the region, elevations from along three transects shown as dotted lines on the map. The transects are A–B (following the Essequibo River), C–D (following the New River), and E–F (from the New River basin to the Rewa River basin, across the Acarai-Corentyne Corridor). Acronyms on the elevational profiles are as follows: NR = New River, ES = Essequibo River, RE = Rewa River.



appears that the white soil is an alluvial deposit, as is also suggested by the white soils between the Essequibo and the oxbow lake mentioned earlier.

After the inventory, I learned that the end of Trail P, which I did not visit, had an area of boulders 1–2 m wide and some blocks of MnO_2-cemented conglomerate. There was a small stream there, but the MnO_2 cement suggests that a larger stream had once flowed through this area. As noted above, when anoxic waters leach iron from soils, they also leach manganese.

Some of the scientists climbed a 700-m peak in the Amuku Mountains. They found areas of laterite on top. This laterite was in larger and harder chunks than any I encountered on Trails F and N. This would be consistent with the summit being part of an older erosion surface (Oronoque, about 60 My, or Kanaku, about 140 My).

Water sampling at this camp was limited by the lack of water in streams. According to members of the advanced team, streams had been drying out rapidly over the previous month. A stream that was flowing one day would be a series of pools, or less, the next. Rapid drying would be consistent with strong groundwater losses from the streams through either the brown or white layers. I sampled the Essequibo and Amuku Creek; a tiny swamp stream was sampled and another was tested. The highest measured conductivity was 12 µS/cm and the lowest 3.4 µS/cm. The pH was 5.3–7, and the temperature 27–32°C. Basically, these are very pure rivers, especially the stream with a conductivity of 3.4 uS/cm which is comparable to the lowest conductivities encountered elsewhere (Fig. 24).

I enquired of several Indigenous experts whether animals seek out special soils or springs in the landscape (such as salt licks), and there appear to be none.

Essequibo River between Camps Amuku and Monkey Jump (11 and 16 November 2024)

The surfaces of many of the granite rocks in this stretch of the river retain a network of quartz crystals that have remained following the breakdown of other mineral gains by weathering into clays (looks white like kaolinite) or complete dissolution (iron has been dissolved, leaving white). This quartz-crystal layer makes the rock surface quite rough and easy to walk on. The petroglyphs along this stretch of river are not pecked. Instead, the surface layer appears to have been polished off to make the designs. This could easily be done with another piece of granite. For details on the petroglyphs, see the *Social landscape* chapter on page 170.

This stretch of the Essequibo River had numerous islands, peninsulas, and bank exposures of rock. Most of this is granite in the form of low hump-like islands and bank exposures, some core stones, most of which are 0.5–2 m in diameter but some of which are enormous (5–10 m). There were several areas with outcrops that were not granite. These included some black rocks that looked like highly metamorphosed basalt and sediments.

Masakeñarî, Camp Amuku, and Camp Monkey Jump are all on a planation surface of about 220 m elevation, a couple meters higher at Masakeñarî, a couple meters lower at Monkey Jump (Fig. 23). A few small rapids are located on the river between Masakeñarî and Monkey Jump. About 40 km downstream of Camp Monkey Jump is Square Nails Falls (which is really a series of rapids). Starting with Square Nails Falls the river drops about 100 m, through a mix of falls and rapids, over the next 142 km (Berrangé and Johnson 1972). The largest falls, Manarowa, has an 18-m drop. This overall 100-m drop appears to correspond to the difference in elevation between the 10 My-old Kuyuwini Erosion Surface and the 2.5 My-old Rupununi Erosion Surface of Berrangé (1977; Fig. 23). This, in turn, suggests that at Camp Amuku and Camp Monkey Jump we were looking at the product of 10 million years of weathering and erosion with associated changes in climate, vegetation, and river-channel patterns.

Camp Monkey Jump (11–16 November 2024)

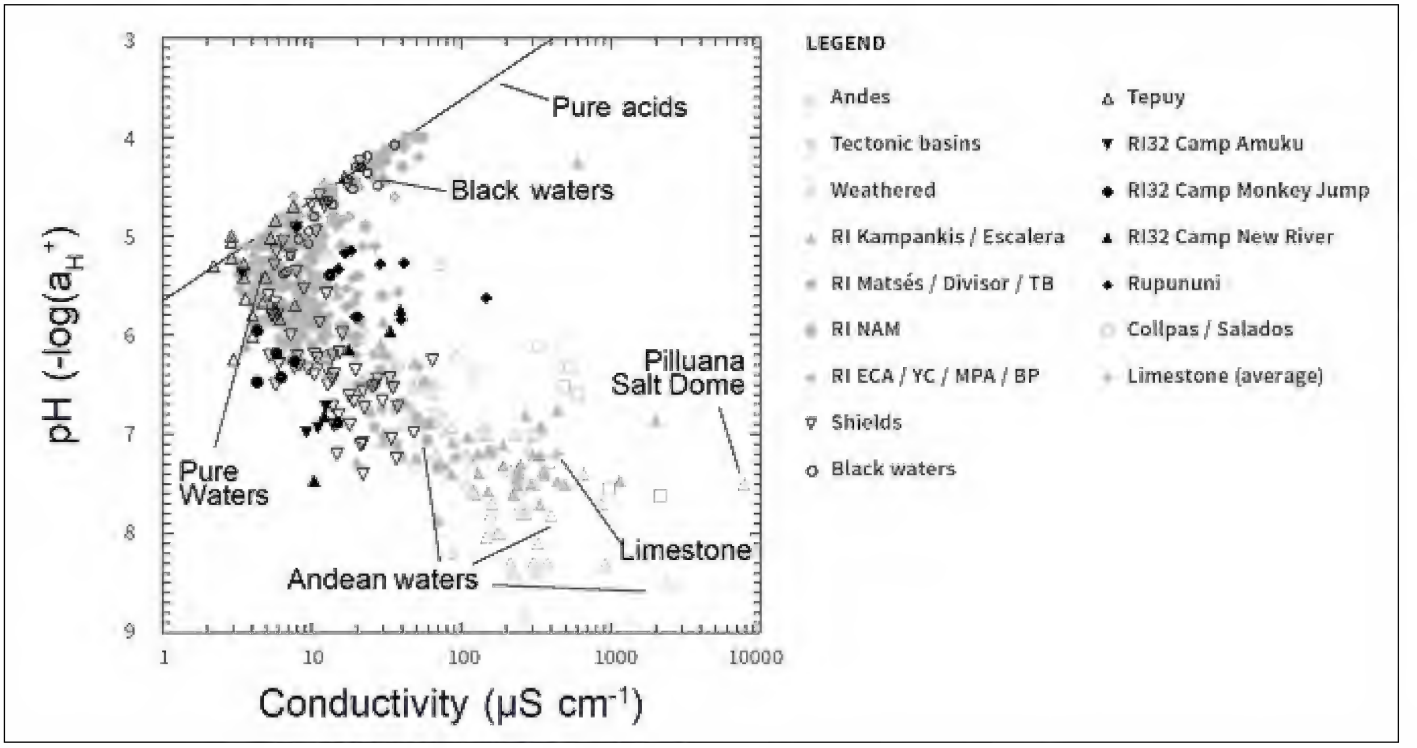
This camp was located on the right bank of the Essequibo River alongside the confluence with Monkey Jump Creek (Taruma Creek). The Essequibo was at a low flow with extensive exposed bedrock in its channel, especially near rapids. The camp was about 3 m above the Essequibo water level, on a flat surface that appears to be seasonally flooded as a backwater, not necessarily as a floodplain. The flat surface did not have many of the features characteristic of a floodplain including water-swept vegetation, swales, and levees. An 8-m flood would inundate this flat surface, however.

The soils were virtually the same here as at Camp Amuku: whitish-gray kaolinitic soils at low elevations (this includes stream channels that penetrate hills heading away from the Essequibo) and a brown loamy soil at all higher elevations near the camp.

People who walked from this camp to the New River drainage crossed a low divide that had a rocky substrate and various plants that are consistent with a thin soil that typically dries completely; plants included ground cacti and terrestrial bromeliads. According to our topographic data, this divide was extremely low, barely a rise over the adjacent watersheds (Fig. 23). Beyond this low divide, on the New River side, the

Figure 24. Field measurements of pH and conductivity of Guiana Shield, Andean, and Amazonian water samples in micro-Siemens per cm (µS/cm) including current and past inventories. The open black symbols represent past stream-water samples collected from the Guiana and Brazilian shields and are expected to be like waters to be encountered during the rapid inventory of the Acarai-Corentyne Corridor. The solid light gray symbols represent samples collected during 10 previous inventories in Amazonian Peru (see references in text). The open light gray symbols correspond to numerous samples collected elsewhere across the Amazon and Orinoco basins. Note that samples from the Guiana and Brazilian shields have conductivity and pH values that are similar to those from flatlands in north-central Amazonian Peru and along the Putumayo River.

Samples from the Acarai-Corentyne Corridor and from a sampling trip to the Rupununi in 2019 are plotted as solid black symbols. Many of the Acarai-Corentyne Corridor samples are ultrapure waters with conductivities of <10 µS/cm. There are two Camp New River samples and a few Rupununi samples with conductivities >15 µS/cm.



landscape, soils, and plants looked much like the Essequibo side of the divide. The lowness and flatness of the divide presumably reflect the effects of 10 million years of slow erosion on the Kuyuwini surface.

The landscape at this camp was dry, and water was not running in many streams. Its relative wetness compared to Camp Amuku was not necessarily a significant contrast. It may be that this camp had a few more large storms in the previous months than Camp Amuku. Monkey Jump Creek and the Saturday Fork of the New River were sampled. Two tiny swampy streams were also sampled as were two larger streams in cross-cutting valley bottoms. Waters were very pure with conductivity 4.3–14.8 uS/cm. The pH was near-neutral, 5.39–6.88.

Camp New River (17–24 November 2024)

Camp New River was located on the western edge of a complex anastomosing rocky confluence between the New and Corentyne rivers. There are at least 50 islets in the complex, and all appear to be rocky. Many of the rocks are black and appear to be metabasalt. The vegetation looked vaguely like that of the Chagres River in Gamboa, Panama, which has a largely basaltic headwaters.

The first impression of Camp New River is that it was hotter, more humid, and the canopy denser than the other camps. Trees also seemed larger, notably the Brazil nut trees. There was, at best, a patchy, thin root mat. On the floodplains of the New and Barrington Brown rivers there was a narrow band of white-clay soil. Higher elevations had dusky reddish-brown soils, similar to the other camps, the lack of a root mat being a notable difference. The lesser root mat suggests that the soils of Camp New River are relatively richer in nutrients.

Bedrock outcrops at lower elevations and core stones through the trail system stood in considerable contrast to what we saw in Camps Amaku and Monkey Jump, where rock was generally rare on the trails near camp, except in low areas. The core stones could contribute to higher rates of chemical weathering and more availability of bedrock derived nutrients

(K, P, S) thereby supporting a lusher forest. Some of the core stones had pits that suggested that less stable minerals had completely weathered out of the rock. Possibilities include pyrite, sulfides, calcite, dolomite, and olivine.

Most of the swamp soils in Camp New River were also a bit different from those in the other camps. Rather than being entirely a dark brown mud, there were extensive creamy brown and light gray clay soils beneath the mud. The few areas of dark-brown soils tended to be the wettest.

Streams at this camp were quite dry, as at the previous two camps. Five streams were measured and three of those sampled. Both the New and Barrington Brown rivers and the one unsampled stream had low conductivities, a bit over 10 µS/cm. Two streams, both draining to the north from the loop of Trail 1, had conductivities >30 µS/cm. These conductivities are quite exceptional indicating that a rock or mineral within the Trail 1 loop is weathering at a much higher rate. This is consistent with core stones along the trails that have numerous surface voids. Water chemistry measurements will help identify whether the extra weathering involves sulfides, an indicator of mineralization.

Both the New and Barrington Brown rivers have arkosic (yellow-brown feldspar-rich) sands. The beds are rocky rather than sandy, indicating that there are probably not extensive granite landscapes upstream on either.

On 20 November 2024 I visited the large rapids (Andira Falls) just up the New River from Cashew Island. The site is remarkable. The drop of the rapids is about 3 m over massive rock and boulders. A 200-m walk over the bedrock exposed in the rapids crossed a mix of gneiss, granite intrusion, highly metamorphosed meta sediments, metamorphosed basalt flows, and porphyry—all of it Precambrian in age. This level of geologic complexity is all but unmappable.

The rapids also have a peculiar feature described long ago by von Humboldt in rapids on the Orinoco River. Upon close inspection one sees that many of the gaps between boulders in the rapids have been filled in by what appears to be a conglomerate of river cobbles cemented by a black matrix. This matrix appears to be manganese dioxide (MnO_2) precipitated from the river itself. The most spectacular feature at this particular rapid was an enormous boulder, ~3 m in diameter, perched atop a pedestal of MnO_2-cemented conglomerate (Fig. 5F).

Locally, this is also seen on the Barrington Brown River. As with the Upper Orinoco Rapids, it is not obvious that the river beds along these stretches are even eroding. They may even be aggrading through the addition of cemented conglomerates. Aggregation at rapids may cause each rapid to be a terrace that effectively controls upstream base level.

DISCUSSION

The part of the Acarai-Corentyne Corridor that we visited is entirely on the Kuyuwini Erosion Surface (Fig. 23), an approximately 10 million year-old pediplane formed on a basement of deep-seated igneous and metamorphic rocks that have been exposed by millions of years of weathering and erosion. The flatness of the landscape means that chemical and physical erosion has proceeded slowly, but the high amounts of rainfall mean that the degree of leaching of soluble minerals and nutrients has been quite intense. The low conductivities encountered in all the waters that we measured support this idea.

Soils in the corridor are nutrient-poor. Shallow soils and vegetation are where much of the nutrients and carbon are located, especially at the first two camps. Extensive deforestation would lead to the long-term loss of both nutrients and carbon from the landscape, meaning that regrowth of forests through secondary succession would be quite slow. Lack of soil cover for a period of time would promote physical erosion of the exposed soil leading to increased sediment loads downstream. The deforestation itself and downstream sediment loading can both reduce biodiversity by damaging habitats.

Mining amplifies the above environmental threats by mobilizing still larger quantities of sediment. Gold mining that uses mercury carries the added threat of contaminating the food chain with mercury. The long history of heating, igneous activity, and dewatering may result in multiple ore bodies, and an equally long history of deep erosion (kilometers of rock) may have removed many of these. Berrangé (1977) provides a map and a summary of ore discoveries in the region. There are very few identified ore deposits, perhaps owing to the difficulties of detailed geologic mapping. Berrangé (1977) notes "small showings of alluvial gold have been reported from numerous localities in the region, but appear unlikely to have any economic importance…. The two most highly mineralized areas discovered so far, the Wakadanawa goldfield and the Marudi Mountain goldfield, are both in the Kwitaro Group with younger intrusive granites nearby." A problem is that people who are not familiar with the geological literature, inspired by a desire for riches, may continue prospecting and potentially damaging this delicate landscape.

The role of MnO_2 as a conglomerate-forming cement in the rapids is poorly understood. Features described earlier, such as the large boulder on an MnO_2-cemented conglomerate pedestal, and the pools and terraces in some rapids can be a source of awe. The MnO_2-cemented conglomerate may be limiting the downcutting by the main river in the rapids, thereby stabilizing the regional base level. If the conglomerate is growing in thickness, it may even be raising base level. This is a phenomenon worthy of further study.

VEGETATION AND FLORA

Authors: Nigel Pitman, Kaslyn Holder-Collins, Marcos Ríos Paredes, Cemci 'James' Suse, Stephen Suse, Matias Waiwai, Tikkil Kenke, Jo Yacipa, Reuben Yamochi, Ronell Lewis, Christopher Bhola, Nehru Narine, and Zachary R. Kachian

Conservation targets: Vast expanses of intact, mature, unlogged forest across an area of transition between two major floristic regions; a mosaic of vegetation types along an 800-m elevational transect, including upland forests, seasonally flooded forests along the major rivers, seasonally wet swamp forests along creeks, and small patches of unique vegetation associated with exposed rock inselbergs and unusual soil types; immense stores of Indigenous knowledge about plants and forests; hundreds of plants used by local communities for food, building material, medicine, and other applications; large stocks of important timber species

INTRODUCTION

In the 188 years since Robert Schomburgk first noted "the exuberance of Vegetation in the Valley of the Essequibo" during an 1837 trip to the region (Rivière 2006a, 251), the forests of the Acarai-Corentyne Corridor have remained largely unexplored by scientists. The only significant floristic inventory to date focused on the northwestern corner of the corridor, where in 2007–2008 Smithsonian botanists collected several hundred herbarium specimens in the former Upper Essequibo Conservation Concession (Kelloff et al. 2023). This paucity of records across such an immense area is a good example of why Ondo et al. (2024) consider Guyana, despite its long and distinguished history of botanical exploration, a global 'darkspot' for plant diversity.

Fortunately, the several thousand plant specimens collected to date just outside the corridor offer a good foundation for understanding its flora (Alonso et al. 2008, Secretaria de Estado de Meio Ambiente do Pará 2011b, 2011c, Kelloff et al. 2011, 2023, ter Steege et al. 2014, Henkel et al. 2016). Because those better-explored areas in southern Guyana are geologically, topographically, and climatically similar to the Acarai-Corentyne Corridor, our expectation is of relatively similar plant communities across southern Guyana's forests.

Vegetation maps confirm this, showing 'mixed forest' covering most of the area, complemented by small strips of 'marsh forest' along rivers and 'submontane forest' in the Acarai Mountains (ter Steege 2001, GLSC 2013). Ter Steege et al.'s (2014) vegetation map of the southern portion of the corridor is more complex, but also shows a close similarity of vegetation between the corridor and Kanashen Amerindian Protected Area.

While understudied by scientists, the flora and vegetation of this region are very well known to Indigenous communities. By including both Indigenous and Linnaean botanists on our team and synthesizing existing information with new fieldwork, we attempted to advance our understanding of the area's flora and vegetation. Given the size and complexity of the area, however, a comprehensive description of these forests will require significant additional work.

METHODS

Prior to fieldwork

In the three months prior to fieldwork, we scanned a selection of publicly available satellite imagery to map notable vegetation features across the corridor (e.g., landslides, large blowdowns, large exposed rocks [inselbergs], swamps, low or sparse vegetation). On 20–21 September 2024, four members of the larger team carried out an overflight of the corridor, circling our three campsites and photographing a number of features flagged in satellite images. This helped to identify a few simpler vegetation types (e.g., swampy areas dominated by monodominant stands of manicole [*Euterpe oleracea*] and ité [*Mauritia flexuosa*]).

To build a list of plant species that have been recorded in the Acarai-Corentyne Corridor or are expected to occur there, we searched biodiversity databases, the scientific literature, and unpublished reports (see *Prior surveys* chapter on page 85). All checklists mentioned in this chapter were standardized using the Taxonomic Name Resolution Service (Boyle et al. 2013, 2021) and the World Checklist of Vascular Plants (Govaerts 2023).

During fieldwork

We sampled plants for 4–5 days at each of three campsites (for a detailed description of the sites, see the *Regional panorama* chapter on page 89). For each vegetation type

accessible via the trail system, we recorded as many plant species as possible, documented especially common or notable plants in those vegetation types, and assessed the importance of each vegetation type for the regional flora.

We collected and photographed a representative sample of every fruiting and flowering plant encountered, making 1–4 duplicates of each herbarium specimen. Collected plants were pressed in newspaper, preserved in 70% ethyl alcohol, and stored in plastic bags during the fieldwork. All specimens were recorded under the numbers of Kaslyn Holder-Collins, series KH468–652. For every herbarium collection, we preserved one 4 x 4-cm piece of fresh leaf for posterior genetic analyses in coin envelopes dried with silica gel. Specimen data were digitized in the field and all photographs uploaded to iNaturalist within a few hours of capture (Fig. 6S). Waiwai names for many plants were provided by Cemci 'James' Suse, Stephen Suse, Tikkil Kenke, Matias Waiwai, Reuben Yamochi, and Jo Yacipa.

We established two tree plots in upland forest, one at Camp Monkey Jump and one at Camp New River. For both plots, all free-standing trees ≥10 cm diameter at breast height were surveyed in a 1-ha transect following one of our trails through upland forest (5 x 2000 m). Each tree in the plots was measured for circumference, identified, and/or collected (sterile vouchers under the numbers of Nigel Pitman, series NCAP11310–11706). While two 1-ha plots are not sufficient to characterize these upland forests, they help put it in context via comparisons with thousands of other such plots established across South America (ter Steege et al. 2023).

In both tree plots, we used an auger to collect soil samples at 0–80 cm depth for posterior analysis of charcoal and pollen by Nina Witteveen and Crystal McMichael at the University of Amsterdam (see methods in Piperno et al. 2021). This method allows a glimpse into the deeper history of these forests, by documenting fires, agriculture, and other landscape features over the last ~5,000 years. We sampled five other soil cores at the first two campsites and at old farm sites nearby (see the *Social landscape* chapter on page 170). These analyses take time and we do not report results in this chapter.

For many of the vegetation types and plant species we encountered, local experts provided targeted information on regional extent and abundance, habitat preferences, cultural importance, seasonal patterns, and other crucial insights that our fieldwork would not have otherwise revealed. For more information on this process, see the *Local ecological knowledge* chapter on page 159.

Post-fieldwork

Immediately after fieldwork, specimens were transported to the herbarium of the Centre for Study of Biological Diversity (CSBD), where they were dried and organized. All specimens were then transported to the Field Museum herbarium for further processing, imaging, and identification, after which one or more duplicates of all species were returned to the permanent collection of the CSBD. Other duplicates were deposited at the Field Museum and distributed to other international herbaria for identification by specialists.

All specimen data, including photographs of live and dried specimens, have been stored in the Field Museum database and shared publicly to the Global Biodiversity Information Facility (GBIF) via the Field Museum's Integrated Publishing Toolkit (https://www.gbif.org/dataset/90c853e6-56bd-480b-8e8f-6285c3f8d42b).

To identify species of special conservation interest, we crossed our list with those of species considered endemic to Guyana (Gallagher et al. 2023), globally threatened species (IUCN 2024; Global Tree Assessment, unpublished data), and CITES-listed species (UNEP 2024).

To incorporate findings from the northern portion of the Acarai-Corentyne Corridor, which we were not able to visit during the rapid inventory, we include the list of species recorded during two Smithsonian Institution expeditions to the former Upper Essequibo Conservation Concession in 2007–2008 (Kelloff et al. 2023). The list incorporates Karen Redden collections 6011–6271 and Ken Wurdack collections 4536–4742; we only included specimens collected to the east of the Essequibo River.

Tree plot data will be deposited in the database of the Amazon Tree Diversity Network (ter Steege et al. 2023).

RESULTS AND DISCUSSION

Vast stores of Indigenous botanical knowledge

Fieldwork in the Acarai-Corentyne Corridor made it very clear that Indigenous residents of southern Guyana possess deep and detailed knowledge about the regional flora. Even Indigenous team members who professed to know little about plants were typically able to provide a local name when asked about a particular plant, as well as a number of other details that are not widely documented in the botanical literature: which month fruits appear, which animals eat the fruits, and what uses the plant has. The breadth and depth of Indigenous knowledge about plants represents a major asset for science, for conservation, for these communities, and for Guyana.

Our brief study did not do justice to this important body of knowledge.

While we worked with botanists from three Indigenous peoples (Waiwai, Wapishana, and Trio), we spent the majority of our time in the field with Waiwai botanists (Fig. 6L). We collected >100 Waiwai plant names and the Linnaean family, genus, or species those names appear to correspond to. That information is not presented in this report; we plan to incorporate it and the plant photos taken in the field into a field guide displaying both Waiwai and Linnaean plant names. With more such tools to 'translate' between naming systems, Waiwai botanists can fill in many of the gaps in our understanding of forest composition in southern Guyana.

General floristic inventory

A preliminary checklist of plant taxa recorded during the 2024 rapid inventory is given in Appendix 1. The same appendix includes plant taxa recorded inside the Acarai-Corentyne Corridor during the 2007–2008 expeditions to the former Upper Essequibo Conservation Concession. The combined list has a total of 693 entries, many of which represent multiple taxa. For example, the list includes nine species of Lauraceae as well as a catch-all row with 27 unidentified voucher specimens in that family. Because most of our 2024 specimens had only been identified to genus at the time this report was written, this checklist will become considerably more precise over the next two years.

At present, the checklist contains 431 species of flowering plants and 34 species of ferns, filmy ferns, and clubmosses. The list is dominated by trees, which account for 281 species. One hundred and eighteen families are represented in our preliminary checklist: 107 of flowering plants and 11 of ferns, filmy ferns, or lycophytes. The 10 families with the most species are Fabaceae, Rubiaceae, Annonaceae, Arecaceae, Orchidaceae, Sapotaceae, Apocynaceae, Bignoniaceae, Chrysobalanaceae, and Moraceae.

We estimate a total regional flora of 2000–2500 plant species, based in large part on prior surveys (e.g., 1105 species recorded to date in Kanashen Amerindian Protected Area; ter Steege et al. 2014). This is much lower than the 5000 predicted by the Map of Life species distribution models, which we believe is a significant overestimate (see *Prior surveys* chapter on page 85).

Species of conservation interest

Relatively few of the plant species in Appendix 1 are threatened, endemic, or in need of urgent management action. This is expected, given that species in the Acarai-Corentyne Corridor are expected to have substantial populations across one of the largest blocks of intact forest on Earth.

Table 5. Main vegetation types in the Acarai-Corentyne Corridor, by extent. For a photograph of each vegetation type see Figs. 6A–D.

Vegetation type	Estimated proportion of the corridor
Mature upland forests (Fig. 6A)	80%
Swamp forests dominated by *Euterpe oleracea* (Fig. 6B)	5–10%
Floodplain forests along major rivers (Fig. 6C)	5–10%
Vine-dominated secondary forests (Fig. 6D)	5–10%

Only three species on our list are considered globally threatened and none of these present an urgent conservation need. The tree *Vouacapoa americana* is classified as Critically Endangered both globally and in Guyana, but the IUCN assessment is outdated and probably incorrect. We and others have found the species to be common in southern Guyana and neighboring Suriname and Brazil (see Table 5). Brazil nut (*Bertholletia excelsa;* Fig. 6R) and rosewood (*Aniba rosodora*) are the other globally threatened species. Both are economically valuable plants listed due to potentially unsustainable harvests. Both also have healthy populations in southern Guyana, although the extremely patchy distribution of Brazil nut stands suggests they were planted there by people (see Shepard and Ramirez 2011).

None of the plant species we recorded are known to be endemic to Guyana. The fern *Adiantum olivaceum* is listed as endemic by the World Checklist of Vascular Plants but GBIF shows potential occurrences in Suriname and Venezuela (as expected, given the environmental similarity). *Hibiscus marioniae*, which is currently only known from a single collection on an inselberg in Guyana's Rewa watershed, is likely to occur in similar habitats in the Acarai-Corentyne Corridor (and in Suriname) but has not yet been recorded there (Dorr 2022).

At least two species appear to be new records for the flora of Guyana. These are the trees *Duguetia stelechantha* (Annonaceae), previously known from Amazonian Brazil and Bolivia (and possibly Colombia), and *Schistostemon macrophyllus* (Humiriaceae), previously known from Venezuela and Colombia.

Eleven species, most of them orchids and cacti with ornamental value, are listed on Appendix II of CITES, which

means their trade is restricted. For a list of these species, see Appendix 1 or the Conservation Targets section of this report.

Major vegetation types observed during fieldwork

During the rapid inventory, we observed four vegetation types that cover significant portions of the landscape. Based on overflight observations, topographic maps, satellite imagery, and fieldwork, we estimate that these vegetation types account for >90% of the Acarai-Corentyne Corridor. Exceptions composing the remainder are described in the next section.

Mature upland forests on the mid-elevation plateau (Fig. 6A)

Upland (*terra firme*) forests cover approximately 80% of the Acarai-Corentyne Corridor. Where we examined them—on the mid-elevation plateau that dominates most of the corridor—they were typically tall, closed-canopy forests growing on deep brown loamy soils. While similar forests probably occur at the lower elevations north of this plateau, we did not visit them; the description of upland forests here mostly applies to those on the plateau.

Our 1-ha tree plots in upland forest at Camps Amuku and New River contained a mean 525 trees with ≥10 cm diameter at breast height. Extrapolating this figure yields ~630 million adult trees in upland forests throughout the Acarai-Corentyne Corridor. These trees account for the lion's share of the corridor's biomass and above-ground carbon, and likely provide habitat for most of its animal species. Assuming similar tree density in the other main vegetation types in Table 5, we estimate a total of nearly 800 million adult trees in the Acarai-Corentyne Corridor.

Basal area in the two upland tree plots averaged 31.9 m^2, high by Amazonian and Guiana Shield standards.[3] Approximately 3% of the trees we inventoried in the uplands were giants with diameters >70 cm and heights often >50 m. These majestic emergents occurred on the landscape at a rate of ~14 per hectare, such that in mature upland forest one or more of them were always close at hand (Figs. 6E,H). While we did not measure tree height precisely, the largest of these trees appeared to be near the maximum limits of tree height for the Amazon basin (Gorgens et al. 2019), given that their canopy leaves could not be studied even with 10x40 binoculars. While diversity was moderate for trees in general—each of our 1-ha plots contained ~150 species—we observed high diversity among the giants as predicted by de Lima et al. (2023). These include *Dinizia excelsa*, *Minquartia guianensis* (Fig. 6K), *Brosimum parinarioides*, *Ruizterania albiflora* cf., *Goupia glabra*, *Eperua falcata*, as well as species in the genera *Parkia*, *Caryocar*, *Guettarda*, *Dipteryx*, and *Eschweilera*. The largest tree we measured was a *Parinari* with a circumference >5.3 m.

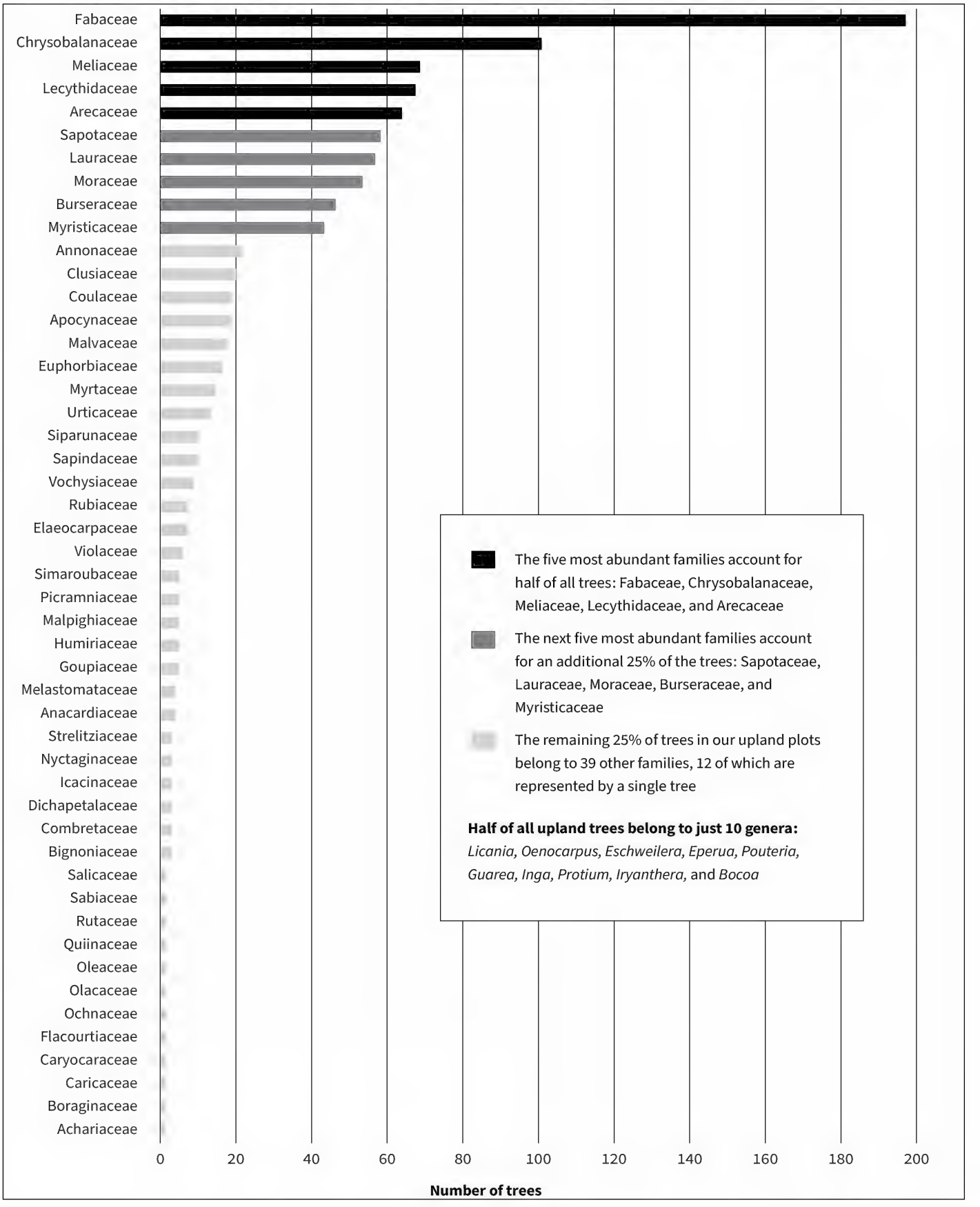
The understory of upland forests was open and easy to traverse. The most common terrestrial herb was the clubmoss *Selaginella conduplicata*. Ferns were rare and mostly restricted to a single as-yet-unidentified *Adiantum*. At our first campsite,

3 Basal area is a unit of physical forest structure that measures the amount of the forest floor that is occupied by standing tree trunks. A basal area of 30 m^2 per hectare means that 0.3% of the forest floor is occupied by trees, while the remaining 99.7% is free to walk about in. Malhi et al.'s (2006) extrapolated map of basal area across the Amazon predicted values of 26–29 m^2 for the Acarai-Corentyne Corridor, 10–20% lower than what we observed.

Table 6. Tree species found to be common in upland forests of southern Guyana and vicinity by prior expeditions, and by a November 2024 rapid inventory of the Acarai-Corentyne Corridor.

Family	Species	Source	Our expedition
Apocynaceae	*Geissospermum argenteum*	ter Steege (1998), Secretaria de Estado de Meio Ambiente do Pará (2011a)	common
Arecaceae	*Astrocaryum sciophilum*	Bánki and Bhikhi (2012)	very common
Euphorbiaceae	*Pausandra martinii*	Bánki and Bhikhi (2012)	frequent
Fabaceae	*Alexa imperatricis*	Bánki and Bhikhi (2012)	frequent
Fabaceae	*Bocoa viridiflora*	Bánki and Bhikhi (2012)	common
Fabaceae	*Vouacapoua americana*	Bánki and Bhikhi (2012), Secretaria de Estado de Meio Ambiente do Pará (2011a)	common
Fabaceae	*Zygia collina*	ter Steege et al. (2014)	common
Malvaceae	*Catostemma fragrans*	ter Steege et al. (2014)	common (as *Catostemma* sp.)

Figure 25. The number of individual trees in two 1-hectare tree plots in upland forests of the Acarai-Corentyne Corridor that belong to different plant families, with notes on dominant genera.



two large trunkless palms dominated the upland understory: *Astrocaryum sciophilum* and *Attalea* sp. These were not as common at our second camp and absent from our third. Other taxa common in the understory of upland forests were *Ampelozizyphus amazonicus*, *Paypayrola* cf. *longifolia*, *Astrocaryum gynacanthum*, *Tabernaemontana undulata*, and *Iriartella setigera*. Epiphytes were rare in all forest strata.

Our tree plots make it clear that upland tree communities are dominated by a small number of plant families, many of which are hyperdiverse in this region of Guyana (Fig. 25). The five most common families account for 50% of all stems; the next five most common account for another 25% of stems. This dominance by a few taxa provides additional support for the idea that a team led by local botanists can rigorously inventory large areas of upland forest.

The most common upland tree species at the sites we visited were *Oenocarpus bacaba* (Arecaceae), *Eperua falcata* cf. (Fabaceae), *Bocoa viridiflora* (Fabaceae), *Minquartia guianensis* (Olacaceae), *Vouacapoa americana* cf. (Fabaceae), *Carapa guianensis* (Meliaceae), and *Pseudolmedia laevis* (Moraceae). Many of these taxa have been found to be common by prior tree plot work in the broader region (see Table 6). Our list of common trees will eventually include a number of currently unidentified species in the genera *Eschweilera*, *Pouteria*, *Iryanthera*, *Licania*, and *Endlicheria*.

In an Amazon-wide analysis, Luize et al. (2024) highlight this area of Guyana as featuring the steepest gradient of tree compositional turnover in the basin: an area of rapid transition between the tree flora of northern Brazil and the tree flora of northern Guyana (e.g., Iwokrama; Clarke et al. 2001). Our tree plots will eventually allow us to determine where the sites we visited fall on that gradient. Given that the tree composition we observed in the plots is more similar to northern Brazil than to Iwokrama, our hypothesis is that much of the transition occurs around the escarpment that marks the change from older soils on the mid-elevation plateau to younger soils in the northern lowlands (see the *Geology* chapter on page 102).

Swamp forests dominated by Euterpe oleracea *(Fig. 6B)*

Swamp forest was observed at all three campsites we visited within the corridor. Mostly 20–30 m high, this forest type was often found between blocks of upland forest, either as strips along creeks or covering larger flat areas of poorly-drained silty soils. Our preliminary estimate is that swamp forest covers 5–10% of the Acarai-Corentyne Corridor.

These forests are almost never monodominant patches of *Euterpe*. Mid-canopy trees important in this forest type were *Inga, Duguetia, Anaxagorea*, and *Potalia*, while canopy trees included *Eperua* and *Ceiba*. Common understory species were *Geonoma* sp., *Monotagma* sp., *Peperomia, Pariana, Vismia,* and *Tabebuia*, along with saplings of *Calophyllum, Machaerium,* and *Tapirira*. *Euterpe*-dominated forest is referred to as important by a number of prior expedition reports to southern Guyana. A similar forest type occurs in the Corentyne-Canjie district of northwestern Guyana (van Andel 2003).

Floodplain forests (Fig. 6C)

Seasonally flooded forests along major rivers occupy ~10% of the landscape of the Acarai-Corentyne Corridor. These forests have a canopy 20–25 m high, mostly consisting of medium-sized trees 25–40 cm diameter at breast height. Close to the river, the understory is dense with lianas and vines; farther inland, the understory is open. Treefalls are frequent.

Important trees of the floodplain forest canopy include *Hydrochoria corymbosa*, *Macrolobium acaciifolium*, *M. angustifolium*, *Discocarpus essequeboensis*, *Eperua rubiginosa* (especially along the Essequibo River), *Caraipa* cf. *densifolia*, *Ormosia coccinea*, *Vatairea* sp., and *Lecythis corrugata*. Characteristic trees in the midstory include *Malouetia* sp., *Guarea macrophylla*, and *Hieronyma oblonga*. Frequent trees along the riverbanks include *Astrocaryum jauari*, *Genipa americana*, *Psidium acutangulum* (especially on rocky islands in the rivers), *Inga* spp,, *Cupania macrostylis*, *Eperua grandiflora* (only at our Camp New River), and lianas such as *Dioclea* (Fig. 6N), *Combretum*, *Securidaca*, *Hiraea*, and *Tanaecium pyramidatum*.

The most common ground herb, which appears to be an indicator of sorts for floodplain forest, is *Trichomanes* cf. *pinnatum*. The understory contains *Myrcia* sp., *Palicourea justiciifolia*, and *Scleria* (especially in treefall gaps). Many of the species mentioned here were also observed in flooded forest and riparian vegetation in the vicinity of the former Upper Essequibo Conservation Concession (Kelloff et al. 2023), and several are common along blackwater (acidic) rivers in the western Amazon.

Along the banks of the Essequibo River near our first camp, we observed several freshwater sponges (*Drulia* sp.; Fig. 6P) on the branches of riparian vegetation that had been underwater during the wet season but were exposed by the low river levels during our visit.

Vine-dominated secondary forests (Fig. 6D)

Roughly half of the vegetation on our trail system at Camp New River appeared to be disturbed forest with a predominance of vines and lianas. This vegetation type stands out dramatically in the false-color satellite image of the area (Fig. 22), in which it appears as a bright yellow swathe covering large areas near our camp, on the opposite bank of the New River, and farther upriver from the areas we studied. These same areas are the lowest-lying on the landscape. We have not yet been able to determine what kind of disturbance is preventing these forests from developing into mature floodplain forests like that we observed elsewhere in the corridor.

In much of this area, the vine-strangled canopy was low and uneven, often reaching no more than 10 m high. Emergents above this tangle, often mysteriously free of vines, included pioneer species of *Inga*, *Pourouma*, and *Cecropia*. Within this matrix were small open areas dominated entirely by a single species, often *Guadua* bamboo (see Table 7).

Minor vegetation types observed during fieldwork

Aquatic plants

Aquatic vegetation was observed along all major rivers, especially in the pools within rapids, and probably accounts for <0.5% of the entire landscape. Some species grow attached to rocks and flower at low water levels (like during our fieldwork); these include *Apinagia longifolia* and *Mourera fluviatilis* (Fig. 6E). Together with a suite of other aquatic plants, including green algae and an aquatic liverwort, the large-leaved vegetative portions of *M. fluviatilis* create a complex underwater structure that the fish team referred to as 'freshwater coral reefs' due to their importance as fish habitat. We observed a few other aquatic species growing in soil at the edges of the pools: *Echinodorus* sp., *Ludwigia* spp., and *Montrichardia arborescens*. The only floating aquatic plant we observed was a water hyacinth (*Pontederia crassipes*) on the New River. Our work surely underestimates the region's aquatic plant diversity, given that Werkhoven and Peeters (1993) documented nine species of Podostemaceae in the Surinamese portion of the Corentyne basin.

Stunted pole forests

This vegetation type was only observed at the first camp, where it occupies ~2 km^2 in a discrete patch that is distinctly purple in our false-color satellite image of the locale (Fig. 20). Similar patches are rare and small on imagery from the rest of the corridor; overflights suggest they may be more common in the portion of the Acarai-Corentyne Corridor that is close to Gunns airstrip, which is located in a small island of natural savanna. We estimate that stunted pole forests cover less than 1% of the total corridor.

The canopy of this vegetation type was only 10 m tall, with a few emergent trees reaching 15 m. Most trees measured 5–10 cm diameter at breast height. Treefalls were rare. Forest structure was quite similar to that of white sand forests elsewhere in the Amazon and a number of species typical of poor-soil forests were present; however, several species characteristic of white sand forests were absent.

The most common species and genera in the canopy were *Eperua rubiginosa*, *Mauritiella*, *Pachira* cf. *flaviflora*, *Pagamea* cf. *guianensis*, and *Caraipa*. The understory harbored shrubby species like *Cybianthus*, *Roucheria*, *Pachira* cf. *flaviflora*, *Pagamea* cf. *guianensis*, and *Discophora guianensis*. Understory herbs included a filmy fern (*Trichomanes* cf. *cristatum*), a genuine fern (*Lindsaea* sp.), and epiphytes such as *Philodendron* spp.

Table 7. Plant species known to form small monodominant patches in the vicinity of the Acarai-Corentyne Corridor.

Family	Species	Vegetation type	Source
Araceae	*Montrichardia arborescens*	Herb in swamps	Bánki and Bhikhi (2012)
Arecaceae	*Euterpe oleracea*	Tree in swamps	RI32 overflight and fieldwork, ter Welle et al. (2000), Kelloff et al. (2011), Bánki and Bhikhi (2012)
Arecaceae	*Geonoma baculifera*	Shrubby palm in swamps	Bánki and Bhikhi (2012)
Arecaceae	*Mauritia flexuosa*	Tree in swamps	RI32 overflight and fieldwork
Fabaceae	*Dioclea virgata*	Vine in disturbed areas	Bánki and Bhikhi (2012)
Poaceae	*Guadua* sp.	Bamboo in disturbed areas	RI32 fieldwork, Bánki and Bhikhi (2012)

Swamp forests dominated by Mauritia flexuosa

Most swamp forest in the corridor is dominated by *Euterpe oleracea*, but in the field and during the overflights, we saw some small patches dominated by the preeminent Amazon swamp palm *Mauritia flexuosa*. Around our camp on the New River, by contrast, the species grew as solitary trees along the river bank.

Low vegetation on bedrock

Other scientists observed an unusual vegetation type at Camp Monkey Jump, at or near the divide between the Essequibo and New watersheds, and provided photos, videos, and verbal descriptions of it to the botany team. This was an area of low, sparse, and sprawling vegetation growing on essentially no soil, where the bedrock sat directly beneath a thin leaf litter. While densely vegetated at ground level, the canopy was as low as ~2 m. The vegetation was ropey and shrubby and included species that appear to be *Calycolpus goetheanus* (wild guava), *Campyloneuron* (fern), *Guadua* (bamboo), and *Clusia*. The most striking component of this vegetation were tall individuals of the cactus *Cereus hexagonus*, the tallest of which were >2 m. We expect this vegetation type to occur very sparsely across the corridor, perhaps most commonly in areas of exposed bedrock that are not high enough to be inselbergs (see next section).

Small monodominant patches

See Table 7 for a list of species that create single-species stands within tiny, scattered patches associated with landslides, swampy conditions, and blowdowns throughout the corridor.

Other vegetation types present but not observed during fieldwork

Mixed forest in the northern lowlands

We were not able to visit forests in the northernmost tip of the Acarai-Corentyne Corridor, where elevation is lowest and a number of tree species more typical of central Guyana have been recorded as common (e.g., greenheart [*Chlorocardium rodiei*], balata [*Manilkara bidentata*], and mora [*Mora* spp.]; Kelloff et al. 2023). A Waiwai botanist on our team with broad experience across southern Guyana (Cemci Suse) noted that these tree species were rare to absent in the upland forests at the campsites we visited but frequent both to the north and to the west, in the Rewa watershed.

Satellite imagery of the northern lowlands show a large expanse of a distinct vegetation type that remains unknown to us. It is most obvious in the headwaters of the Berbice River, where a lighter-colored vegetation type occupies roughly half of that watershed, in a reticulate pattern associated with the drainage network. But whereas one would expect riparian vegetation in a headwaters region to form narrow strips along water bodies, here this unknown vegetation type occupies at least 50% of the headwaters. It merits additional study.

High-elevation forests

Another intriguing vegetation type that we were unable to sample occurs at the highest elevations of the Acarai Mountains (>700 m). While technically high enough to be described as montane, the forests at these elevations do not appear to support a significantly different plant community than the adjacent lowlands. They are also very small in extent; only about 1,000 ha of land in the corridor exceeds 700 m above sea level.

Other expeditions have succeeded in sampling the plants of the highest peaks in the Acarai Mountains. In 1998, David Clarke and colleagues from the Smithsonian Institution sampled what they describe as "the highest peak in the central Acarai Mountains, 10 km south of the Sipu River" (Kelloff et al. 2011). They write: "On the summit the team found dense forest on brown sand and granite boulders with *Catostemma*, *Oenocarpus*, and *Bactris*." These are all genera (and soil conditions) that are common in the forests we sampled at lower elevations. However, the authors go on to describe a vegetation type that does seem different from anything we saw during the rapid inventory: "Another location on the summit was dominated by scrub forest on peat and granite with *Erythroxylum*, *Clusia*, and Myrtaceae."

Inselbergs and waterfalls

Satellite imagery indicates that ~500 ha of the Acarai-Corentyne Corridor consists of exposed rock surfaces, often in the form of inselbergs: large bare mountains rising above the surrounding forest (see Fig. 1). We were not able to visit any inselbergs during the rapid inventory but are confident they harbor a small number of specialized plants, based on botanical surveys of inselbergs in the adjacent Rewa watershed (ter Welle et al. 2000). This includes at least one plant species known only from southern Guyana and not yet confirmed to occur in any of Guyana's existing protected areas: the shrubby *Hibiscus marioniae* (Dorr 2022).

Ter Welle et al. (2000) note another unique habitat for plants on rocks bathed by the permanent spray of major waterfalls on the Rewa River. While we did not visit large

waterfalls during the rapid inventory, they do occur on the Essequibo River, and we expect this habitat to be present in the Acarai-Corentyne Corridor.

FISHES

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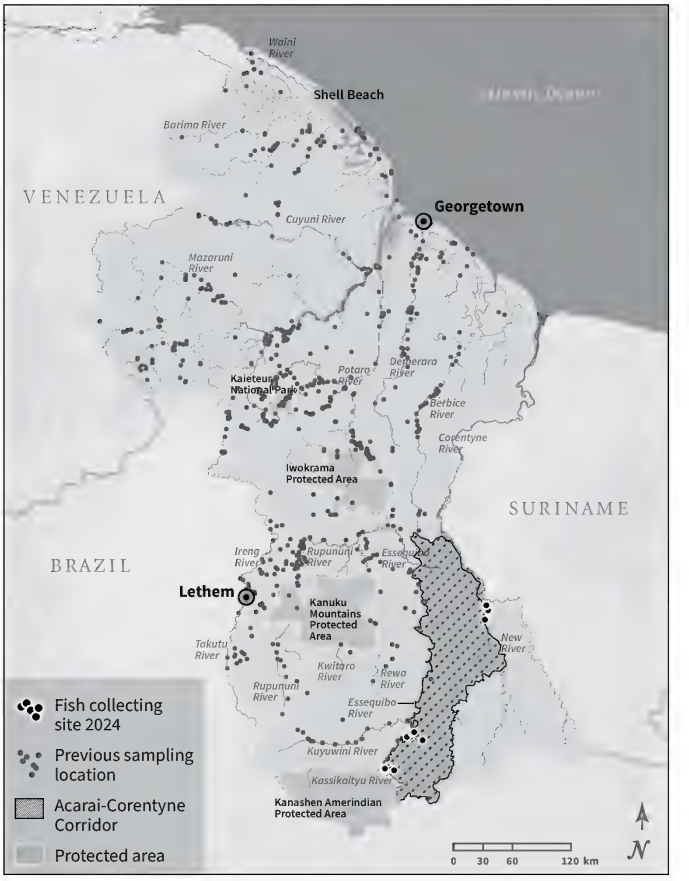
Conservation targets: Well-preserved riparian forest habitats along rivers, creeks, and lakes, and clean unpolluted waterways with healthy populations of aquatic plants in the rapids of both the Essequibo, Berbice and New rivers; major food fishes likes haimara or wolf fish (*Hoplias aimara*), banana catfish (*Phractocephalus hemioliopterus*), tiger catfish (*Pseudoplatystoma* sp.), peacock bass (*Cichla* cf. *ocellaris* and *C.* cf. *temensis*), *Prochilodus rubrotaeniatus*, freshwater stingrays (*Potamotrygon* spp.), and other taxa important to local communities; many species in the genera *Corydoras*, *Hoplisoma*, *Pseudacanthicus*, *Guianacara*, *Megalamphodus*, *Anostomus*, *Moenkhausia*, and others that are not currently exploited but are potentially valuable to the ornamental fish industry; local Indigenous knowledge of fishes and their behavior and habitats

INTRODUCTION

The Acarai-Corentyne Corridor is bordered by two of Guyana's largest rivers—the Essequibo and New—flowing independently into the Atlantic Ocean. These watersheds are largely but not entirely distinct from the Orinoco River to the northwest and the Amazon River to the south and west. The Essequibo connects to the Amazon and Orinoco seasonally through the hydrological corridors at the Rupununi and Casiquiare portals (de Souza et al. 2012, 2020). Likewise, at least one hydrological connection has been reported between the headwaters of the Corentyne River and the headwaters of the Trombetas River (Smith 1940). Due to this hydrological complexity and its dynamic geological history, the Guiana Shield continues to yield many new freshwater fish species and even genera (e.g., Vari and Ferraris 2009, Alofs et al. 2014).

In the Acarai-Corentyne Corridor, elevation gradually slopes up from about 75 m above sea level in the north to a maximum of 875 m in the Acarai Mountains to the south. Most of the area is covered in dense forest, which is one of the largest continuous areas of relatively pristine lowland tropical rainforest in the world (Mol et al. 2025). Although there is evidence of human occupation in the past, today the corridor is uninhabited except for travel between nearby Indigenous Waiwai, Wapishana and Trio communities. We found little

Figure 26. Collecting sites for freshwater fishes across Guyana (dark gray dots; Taphorn et al. 2022) and collecting sites sampled during a rapid inventory of the Acarai-Corentyne Corridor (black/white dots).



evidence of human impacts, but tributaries to the Essequibo, such as the Kuyuwini in the upper Essequibo (Taphorn and Kolmann 2016), and tributaries of the Corentyne in Suriname (Ouboter 2007) have been negatively impacted by gold mining, which destroys the benthic community, introduces high levels of sediments that increase turbidity, and injects toxic mercury into the aquatic food chain.

There have been few prior scientific studies of this region's fishes. A recently published checklist of the freshwater fishes of Guyana (Taphorn et al. 2022; see Fig. 26) showed that while most of the country has been sampled, there is a large gap in the upper Essequibo and tributaries of the upper Corentyne River, such as the New River. The authors of that study listed 44 species of fishes not yet known from Guyanese waters, but which might be found in the Corentyne River tributaries of Guyana. Mol et al. (2012) reported that 276 of the 394 total fish species in Suriname are found in the Corentyne. Within the Acarai-Corentyne Corridor, Willink et al. (2013) assessed the fishes in the northwestern lowland portion and recorded 109 species. Farther south, Dutra et al. (2020) identified 14 fish

species in a rapid assessment in Brazil's Pará state, with one sampling site in the Mapuera River near the southern border of Guyana, an area that displays similar habitat to the headwaters of the Essequibo River tributaries.

We aimed to assess the freshwater fish fauna of the Acarai-Corentyne Corridor to provide baseline information in a poorly known region. Filling this gap will enable scientists to refine our understanding of freshwater fish distributions in Guyana, provide insights into the biogeographical context of neighboring bioregions (e.g., the Guiana Shield and Amazon basin), and possibly discover new species to science. Our study of freshwater fishes will also inform decision-making on conservation efforts underway in the Acarai-Corentyne Corridor.

METHODS

Fieldwork was conducted over 21 days (5–24 November 2024) in the upper Essequibo and Corentyne river basins of southeastern Guyana. We sampled a total of 35 sites at three campsites: 17 sites at Camp Amuku; eight sites at Camp Monkey Jump; and 10 sites at Camp New River. These 35 collection sites are listed in Appendix 2 and also shown in Fig. 26; additional information is provided at https://doi.org/10.5061/dryad.m0cfxppg5. For more information on the study sites, see Fig. 4 and the *Regional panorama* chapter on page 89.

Fishes were collected both during the day and night using several methods: a 72-foot experimental gill net (Fig. 7U) with four 6-foot tall sections of different mesh sizes (0.5, 1, 1.5 and 2-inch mesh); an 8-foot diameter cast net (Fig. 11Q) with 0.5-inch mesh size; and small drag seines (6 x 6 feet with 0.25-inch mesh and 6 x 20 feet with 0.125-inch mesh). Baited hook (Fig. 11P) and lines and fine-meshed hand nets were also used. At two sites, one in the Essequibo and one in the Corentyne River, we used traditional Indigenous fishing techniques. Juice from hairari vines (*Deguelia chrysophylla* cf.) was leached into slow currents of small water bodies to immobilize fishes via vasoconstriction properties similar to the action of the insecticide rotenone. This method produced the most complete and abundant fish samples obtained during this study.

Sampling was conducted during the dry season with unusually high air and water temperatures according to local inhabitants. The four main fish habitats we sampled included sandy beaches in main river channels; the main river channels themselves (with hook and line); rocky rapids, frequently covered by aquatic plants (Podostemaceae); and forest creeks, often with low flow or reduced to isolated pools. Water type was mostly clear, sometimes a bit murky, and no sites had true black water. Water quality was mostly high, unpolluted, with acidic pH values and very low dissolved minerals (hardness and conductivity). We obtained geographic coordinates with a handheld GPS unit and took photographs of every site.

Most of the fishes we collected were photographed in the field to capture live coloration. All specimens from which DNA tissue samples were taken were photographed after preservation to aid in their identification. Individuals were identified, sorted, and counted using current taxonomic keys and some were identified by experts using these photographs. Valid names were confirmed using the Catalog of Fishes (Fricke et al. 2025). Fishes were preserved in 10% formalin,

Figure 27. Taxonomic breakdown of freshwater fish species collected during a rapid inventory of the Acarai-Corentyne Corridor: (**A**) species by order and (**B**) species by family.

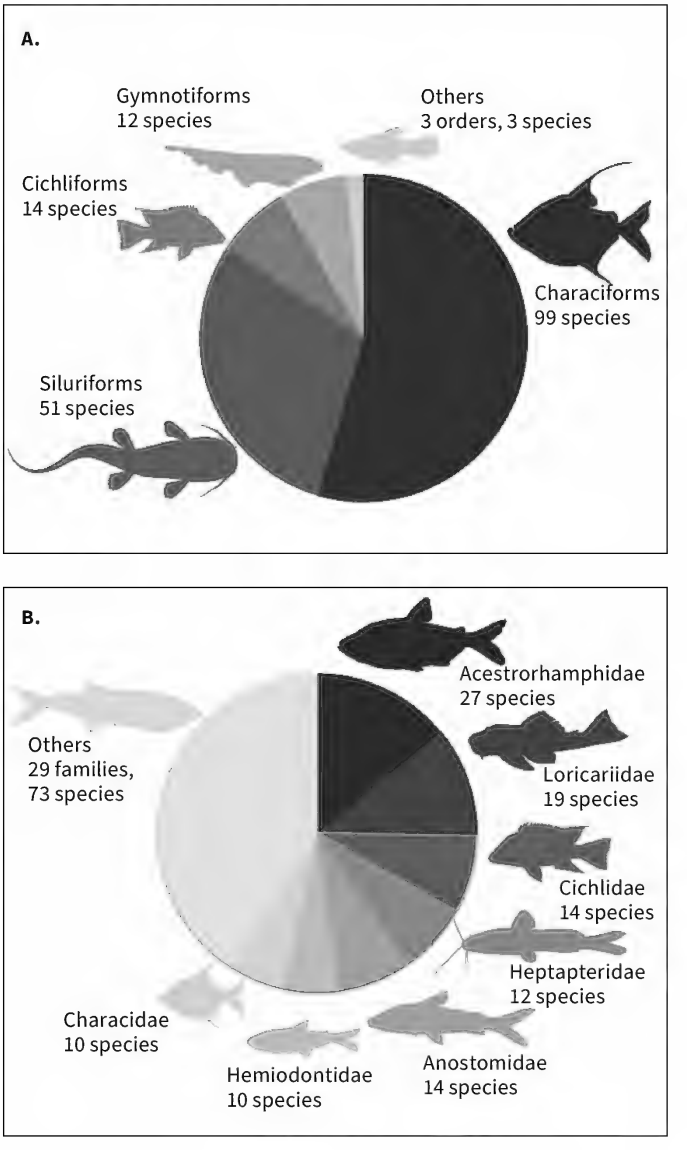
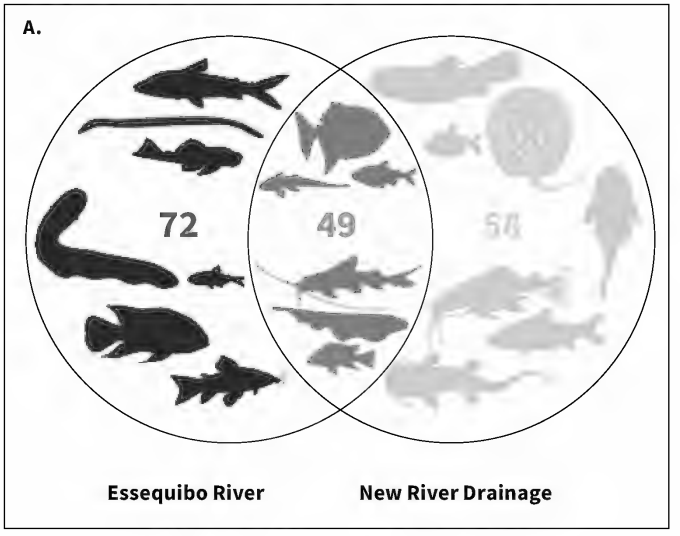
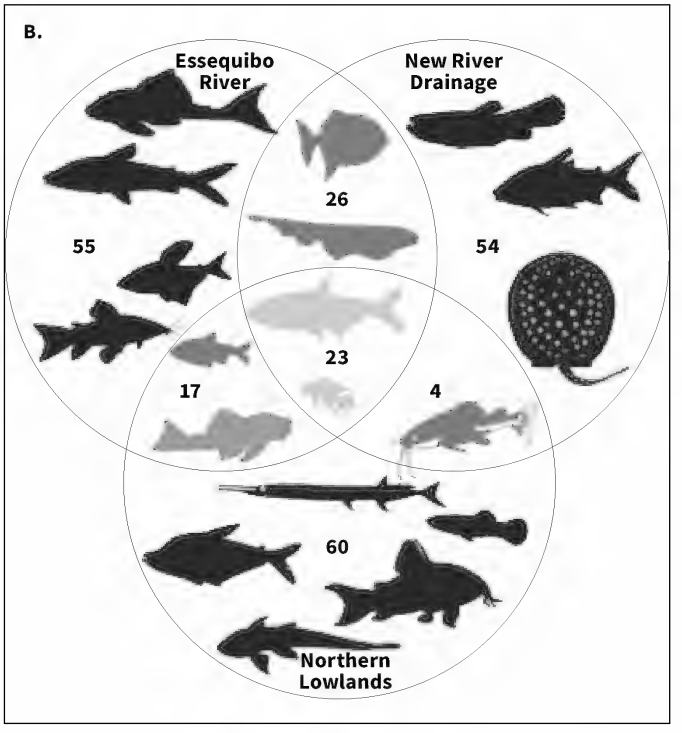


Figure 28. Number and overlap of freshwater fish species recorded from different watersheds of the Acarai-Corentyne Corridor. (**A**) Fish distributions in the Essequibo and New river drainages based on collections made during the rapid inventory. (**B**) Those same fish distributions compared with collections in the northern lowlands of the Essequibo River (Willink et al. 2013).





and larger specimens were injected with formalin to halt deterioration of the gut. All specimens were anesthetized with tricaine methanesulfonate (MS-222) and tissue samples were obtained from 642 select individuals (each photographed with the tissue tag number) and preserved in 95% ethanol for further genetic analyses. All whole fish specimens were processed and definitively identified at the Field Museum of Natural History in Chicago, Illinois, USA. Selected voucher specimens will be returned to the Centre for Study of Biological Diversity after identifications are verified.

In addition to the methods described above, a number of fish species were recorded by a separate team using eDNA metabarcoding of 97 water samples collected during the inventory. For a detailed description of those methods, see the *eDNA* chapter on page 151. Below we present results from both the field surveys and the eDNA analyses.

RESULTS

We collected 3446 whole specimens belonging to 179 species of fishes in 36 families (see Appendix 3 for the full species list). Environmental DNA analysis found 106 fish species, 51 of which were also captured via conventional methods, and 55 that were only detected via eDNA. All methods together yielded a total of 234 freshwater fish species. We estimate a regional ichthyofauna of >400 species.

Thirty-three of these species are potentially new to science, an additional 22 are new records for Guyana, and nine are considered endemic to the country. Species collected during the inventory increased the total number of Guyana's freshwater fish species from 657 to 679.

The most diverse orders were Characiformes (55.3%) and Siluriformes (28.5%), with 99 and 51 species, respectively (Fig. 27A). Cichliformes ranked third with 14 species (7.8%) and Gymnotiformes fourth with 12 (6.7%). Myliobatiformes, Perciformes, and Synbranchiformes were represented by fewer than three species (Appendix 3). The top five most diverse families (Fig. 27B) were Acestrorhamphidae with 27 species (15.1%), Loricariidae with 19 species (10.6%), Cichlidae with 14 species (7.8%), Anostomidae with 14 species (7.8%), and Heptapteridae with 12 species (6.7%). The species most commonly collected at all sites were from the genera *Moenkhausia, Jupiaba, Bryconops* (Fig. 7C), *Leporinus* (Fig. 7H), and *Guianacara*.

Fish communities in the Acarai-Corentyne Corridor showed distinct communities across drainages and habitat regions. The Essequibo and New rivers draining western and eastern edges of the corridor, respectively, shared a quarter of fish species, but the majority of fishes were unique to either drainage (Fig. 28A). We also found distinct fish communities above and below King Williams IV Falls, in the northern lowland area of the Essequibo River, with few shared species. The independent nature of these drainages along with biogeographic features (e.g., waterfalls) appear to be shaping fish communities in the corridor (Fig. 28B).

DISCUSSION

As the first ichthyological survey of Guyana's New River basin, this expedition filled a major gap in our knowledge of the country's freshwater fishes. It also made clear that there is much more to learn from these rivers. The species accumulation curve from the rapid inventory suggests that further collecting in the Acarai-Corentyne Corridor will yield at least 150 additional species of freshwater fishes (Fig. 29). Based on our findings, many of these species will be new to Guyana or new to science.

Taphorn et al. (2022) reported 657 species of freshwater fishes for Guyana and predicted that an additional 44 species might be added to the list when the New River and other Corentyne tributaries could be sampled. We collected 22 of those 44 species, raising the total freshwater fish diversity of Guyana to 679 species. According to Mol et al. (2012), 276 species of freshwater fishes have been reported from the Surinamese portion of the Corentyne River basin. Our collections from the Guyanese portion resulted in just over 70 species. Having just scratched the surface of this very diverse and poorly documented fauna, we find it essential to continue research and exploration in Guyana's portion of the Corentyne basin. According to the species accumulation curve it would require approximately 100 sampling sites to arrive at the asymptote of about 325 species.

Key habitats for freshwater fishes

We spent much of our collecting time and effort sampling rapids in the main channel of the river and its tributaries. Collecting fishes here was difficult because of high water velocity, clear water, and innumerable hiding places offered by the piles of rocks and abundant aquatic plants. The fishes we were able to catch were distinctive and well-adapted to life in these lotic environments. Examples include *Myleus pacu* (Fig. 7Q), *Prosomyleus rhomboidalis*, *Characidium zebra*, *Anostomus anostomus*, *Ancistrus nudiceps*, *Cteniloricaria platystoma,* and *Pseudancistrus* spp.

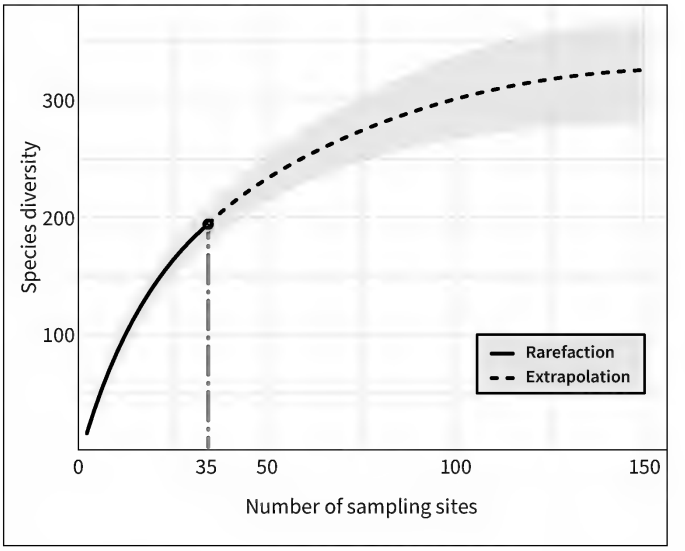
In contrast to lower elevations of the Essequibo River basin, sand beaches were less common in the upland forests and were often cluttered with rocks and submerged trees that complicated our use of drag seines. Just a few species, such as *Bivibranchia fowleri*, *Bryconops caudomaculatus*, *Jupiaba polylepis*, *Guianacara dacrya*, and *Moenkhausia lepidura,* were commonly found associated with these beaches.

We also sampled forest streams, which were often mostly dry or reduced to a series of isolated pools by the extreme drought conditions. Many of the fishes we found in these streams were those with adaptations to breathe air and survive low oxygen concentrations and higher-than-usual temperatures. These include *Gymnotus carapo*, *Megalechis thoracata*, *Hoplias aimara*, and *H. malabaricus.* In creeks with more flow and higher oxygenated waters, we also found many small species of *Hemigrammus* and *Moenkhausia*, medium-sized characids like *Jupiaba* and *Bryconops* (Fig. 7C), as well as medium-sized fish predators like *Acestrorhynchus* and *Saxatilia*. A major surprise was finding very large stingrays, *Potamotrygon boesemani* (Figs. 7A, 11J), in streams of the New River drainage.

The fourth major habitat we sampled were the main river channels, primarily by gill net, cast net or hook and line. Deep pools and central channels yielded large fishes such as the banana catfish (*Phractocephalus hemioliopterus*; Fig. 7S), tiger catfish (*Pseudoplatystoma tigrinum*), toad catfish (*Batrochoglanis* sp.), ornate antenna catfish (*Pimelodus ornatus*), and very large black piranhas (*Serrasalmus rhombeus*).

In addition to the amazing diversity of fishes, we were puzzled by the absence of some species usually found within the habitats we sampled. For example, large catfishes and stingrays were absent from our first two camps on the upper Essequibo River. Local inhabitants informed us that those fishes are not able to traverse King William IV Falls and are thus stranded farther downriver. We were also surprised by the absence of red-bellied piranhas (*Pygocentrus nattereri*) from both the upper Essequibo and New river drainages. Schools of these fish predators are typically abundant. At the same time, both river drainages supported robust populations

Figure 29. Species accumulation curve for freshwater fishes during a rapid inventory of the Acarai-Corentyne Corridor.



of black piranha (*Serrasalmus rhombeus*), which were particularly large (some >2 kg) and often stole bait from our hooks.

Unsampled regions and habitats

The expanded Acarai-Corentyne Corridor (see pages 18–19) includes one major aquatic feature that we were not able to sample: the headwaters of the Berbice River, another of Guyana's independent flowing rivers that empties into the Atlantic Ocean. The Berbice basin has been shaped by deep geological history and was formerly a part of the proto-Berbice. The isolation of the headwater region for millions of years has likely resulted in a unique fish fauna, although no scientific study has assessed this region exhaustively. Lower portions of the river have been significantly impacted by agriculture while the headwater region is in pristine condition.

We also echo the conclusion of Willink et al. (2013) that a key segment of the Essequibo River between King William IV Falls and Apoteri remains undersampled. Perhaps the best example of this is arapaima (*Arapaima arapaima*), an apex predator and the largest freshwater-scaled fish in the world, which is known to occur in nearby Cocoa Creek (personal obs.) but was not recorded in that stretch of the Essequibo (Willink et al. 2013). These fish are under focused conservation efforts throughout their range and an important species for ecotourism in nearby communities.

More intensive surveys of both areas are a high priority.

Additional sampling methods

Throughout the rapid inventory, our team worked closely with local Indigenous experts to identify and collect fishes. Their deep knowledge of the landscape, waterways, and aquatic biodiversity enhanced our collections tremendously. One local fishing method involved the juice from the hairari vine (*Deguelia chrysophylla* cf.), which is leached into the water to immobilize fishes (Figs. 11D–G). This method enabled the collection of many species that would have otherwise been missed due to their difficulty of capture. Indeed, the station where we deployed this technique along the New River yielded the largest number of species of any station in the rapid inventory, where we collected 53 species and 1160 individuals. This is more than one-third of the total individuals (3446) collected on the rapid inventory. Two species *Cetopsidium roae* and *Phenacogaster megalostictus* are endemic to Guyana while the knifefish *Sternopygus* sp. is likely a new species to science. The second local fishing method was a trap built with sections of a palm trunk, vines, and poles (Fig. 11R), which succeeded in collecting several species of large important food fishes, such as haimara or wolf fish (*Hoplias aimara*). For more details on these methods, see the *Local ecological knowledge* chapter on page 159.

Aquatic eDNA provided additional insights into fish diversity in the Acarai-Corentyne Corridor. Over half of the fishes detected using eDNA were only found through this tool, 55 of 106 fish species. This increased our total number of fishes in the Acarai-Corentyne Corridor to 234 species. In addition to traditional methods for capturing fishes, use of innovative methods like eDNA supplement surveys of biodiversity and will be an important tool for research and monitoring in the Acarai-Corentyne Corridor. For more details, see the *eDNA* chapter on page 151.

AMPHIBIANS AND REPTILES

Authors: Antoine Fouquet and Leandro J. C. L. Moraes

Conservation targets: diverse, well-conserved amphibian and reptile communities; six species recorded for the first time in Guyana (*Chiasmocleis haddadi, Leptodactylus fremitus, Pristimantis grandoculis, Rhinella lescurei, Pipa aspera*, and *Arthrosaura kockii*); two possible new species likely with a large portion of their total ranges within the Acarai-Corentyne Corridor (*Anomaloglossus* sp. and *Arthrosaura* cf. *reticulata*); a singular herpetofauna composition compared to the northern half of Guyana; range limits for eastern- and southern-distributed species that overlap within the Acarai-Corentyne Corridor; two recorded species considered globally Vulnerable (the turtles *Chelonoidis denticulata* and *Podocnemis unifilis*); several species of frogs, boas, caimans, and turtles listed in Appendix II of CITES

INTRODUCTION

The Guiana Shield harbors a rich amphibian and reptile fauna. Its highlands (Pantepui) are widely known as a singular Neotropical biogeographic region (like the Andes or the Atlantic Forest) due to their exceptional levels of biological endemism and the presence of relictual lineages (e.g., Fouquet et al. 2024, Kok et al. 2018). The Guiana Shield lowlands, in turn, harbor amphibian and reptile species communities with strong Amazonian affinities but many endemic lineages nonetheless (Fouquet et al. 2021, Vacher et al. 2024). This diversity, however, remains vastly underestimated by current taxonomy, and more than 40 new species of amphibians from this lowland region within Amazonia have been described over the last two decades (Frost 2024).

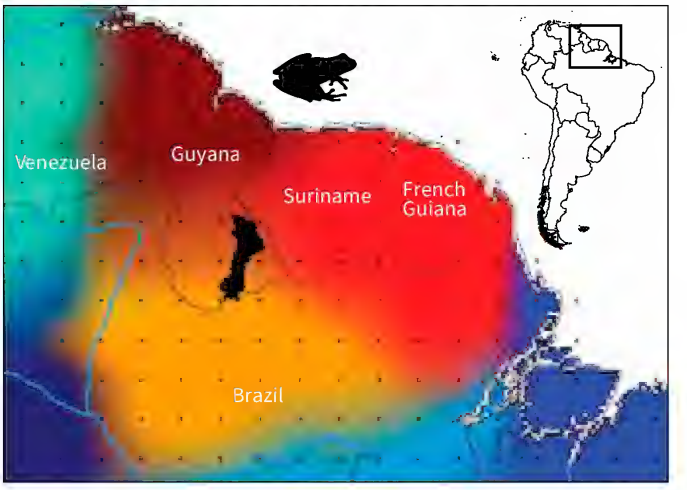
Nevertheless, our understanding of the broad variation in species composition across the eastern lowlands of the Guiana

Shield (hereinafter 'Guiana region') has improved significantly in the last decade. Using DNA-based species delimitation, Vacher et al. (2020) modeled the frog community structure across northeastern Amazonia and delimited bioregions (areas sharing relatively similar species composition). Under this approach, they found more precise boundaries for the Guiana region and estimated that ~80% of its lineages are endemic, a drastic increase from previous estimates (~33% based on IUCN data). They also found that the Guiana region is composed of three sub-bioregions, with southern Guyana lying precisely at their intersection. However, data are scarce for the central part of the 'Guiana region' and the boundaries thus ill-defined (Fig. 30).

Southern Guyana has been very little explored for amphibians and reptiles. Most available information comes from older expeditions, sporadic samplings, and inventories conducted in more distant locations, making it challenging to compile a comprehensive list of expected species for the region. A few expeditions to the Acarai Mountains, Kanashen Amerindian Protected Area, and New River regions in the early 20th century resulted in the collection of amphibian and reptile specimens currently deposited in museums abroad (see the *Prior surveys* chapter on page 85 for a history of previous biodiversity expeditions to the region). It is difficult to trace back all those specimens, but some of them served as the basis for the description of new species, such as the amphibians *Chiasmocleis hudsoni*, *Chiasmocleis shudikarensis*, *Hyalinobatrachium taylori*, *Pristimantis inguinalis*, *Synapturanus mirandariberoi* (Fig. 8D), *Trachycephalus hadroceps*, and *Caecilia pressula* (currently a synonym of *C. tentaculata*), and the reptiles *Amphisbaena vanzolinii*, *Micrurus averyi*, and *Ninia hudsoni*.

More recently, those historical records with deposited specimens have been compiled (Cole et al. 2013), and a series of new inventories conducted across northern Brazil, along the border with Guyana (Acarai in Ávila-Pires et al. 2010), have expanded our understanding by adding new species occurrences in this region. Additionally, a Rapid Assessment Program (RAP) survey was conducted on the Guyana side of the Acarai Mountains, further confirming much of the expected species diversity (Señaris et al. 2008). Additional inventories have been conducted in the nearby Kanuku Mountains (PAC 2015) and a species list was compiled from the former Upper Essequibo Conservation Concession located at the northern tip of our focal area. However, this last list relies on outdated taxonomy that is incompatible with our new data and has therefore been omitted from this work. Finally, in

Figure 30. Bioregions of the Guiana region (in red, brown and orange; from Vacher et al. [2020]) based on frog species distributions, delimited from more than 8700 mtDNA sequences. The Acarai-Corentyne Corridor is depicted in black, and lies at the intersection of the three bioregions.



recent decades several studies have produced DNA sequences based on specimens from southern Guyana and adjacent regions, particularly the Acarai (Brazil) and Bakhuis mountains (Suriname). From this molecular perspective, our understanding of species limits and distributions in these regions has been updated, revealing new geographic records and the still pervasive presence of undescribed diversity.

Moreover, available records strengthen the idea that southeastern Guyana represents a transition zone across distinct Guiana Shield bioregions with many non-overlapping species across these previous inventories scattered around the Acarai-Corentyne Corridor (i.e., many species seem to reach a distributional limit in the region). Besides those advances, the remaining knowledge gaps have limited our understanding of species diversity and their distributions within the faunistic contact zone of southern Guyana. Therefore, we aimed to enhance this knowledge by surveying the herpetofauna in three distinct localities within the Acarai-Corentyne Corridor.

METHODS

Before undertaking fieldwork we generated a list of expected species for southern Guyana by compiling available data from previous inventories made in the direct vicinity of the Acarai-Corentyne, including much of the literature cited in the introduction. That list is given in Appendix 4.

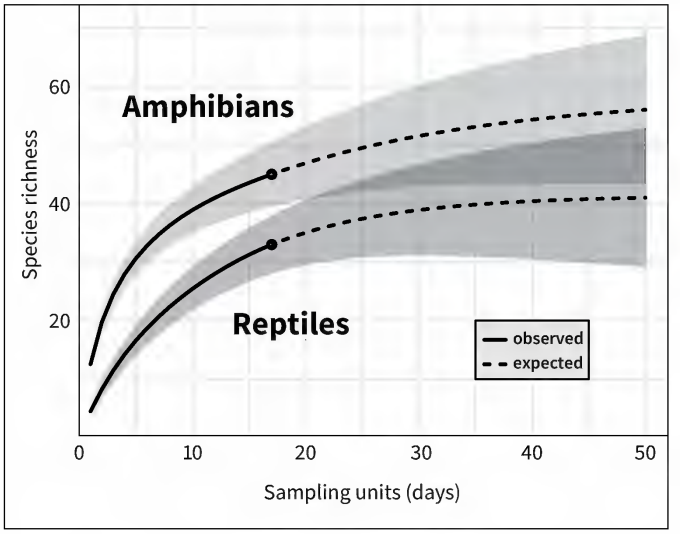
We surveyed amphibians and reptiles at three sites in the Acarai-Corentyne Corridor for 17 days (5–23 November 2024), totaling 5–7 sampling days at each sampling site. For more

information about the three study sites, see Fig. 4 and the *Regional panorama* chapter on page 89.

Two researchers visually or acoustically recorded individuals by diurnal and nocturnal active surveys (Crump and Scott 1994) along established trails for a total of 91 hours. To maximize the species recorded in a short period, we surveyed the most distinct microhabitats present in the area, incorporating local knowledge about the best sites to find different species. Surveys in water bodies were prioritized, as those habitats harbor a higher diversity of amphibians and support many reptile species, but also because the conditions were particularly dry. As many species, especially reptiles, are secretive and rarely encountered, we also recorded opportunistic encounters of amphibians and reptiles by all team members. All individuals recorded within the surveys were identified to the species level based on the literature. We also recorded their maturity, sex, microhabitats and activity patterns.

We took photographs of at least one specimen of all the species collected, and identified specimens based on literature. Up to 10 specimens of each recorded species were collected. Collections adhered to Guyanese regulations, particularly regarding species listed in CITES Appendices I and II. All collected specimens were euthanized using standard methods (AVMA 2013). Amphibians were anesthetized by applying a small amount of benzocaine gel to the skin or by immersing them in a buffered solution of tricaine methanesulfonate (TMS/MS222), followed by a lethal intraperitoneal injection of TMS/MS222. Reptiles were euthanized using an intraperitoneal injection of TMS/MS222. Specimens were then fixed in 10% formaldehyde and preserved in 70% ethanol (Heyer 1994). Prior to fixation, tissue samples (liver or muscle) were collected and stored in absolute ethanol for subsequent genetic analyses. For ecological analyses, rarefaction curves were generated using the R statistical software package iNEXT (Chao et al. 2014).

Figure 31. Extrapolated rarefaction curves for both amphibians (light gray) and reptiles (dark gray), showing the variation in species richness related to sampling effort (all camps). Shaded areas represent 95% confidence intervals.



In addition to the methods described above, a number of amphibian and reptile species were recorded by a separate team using eDNA metabarcoding of 97 water samples collected during the inventory and processed afterwards. For a detailed description of those methods see the *eDNA* chapter on page 151. Below we present results from both the field surveys and the eDNA analyses.

RESULTS

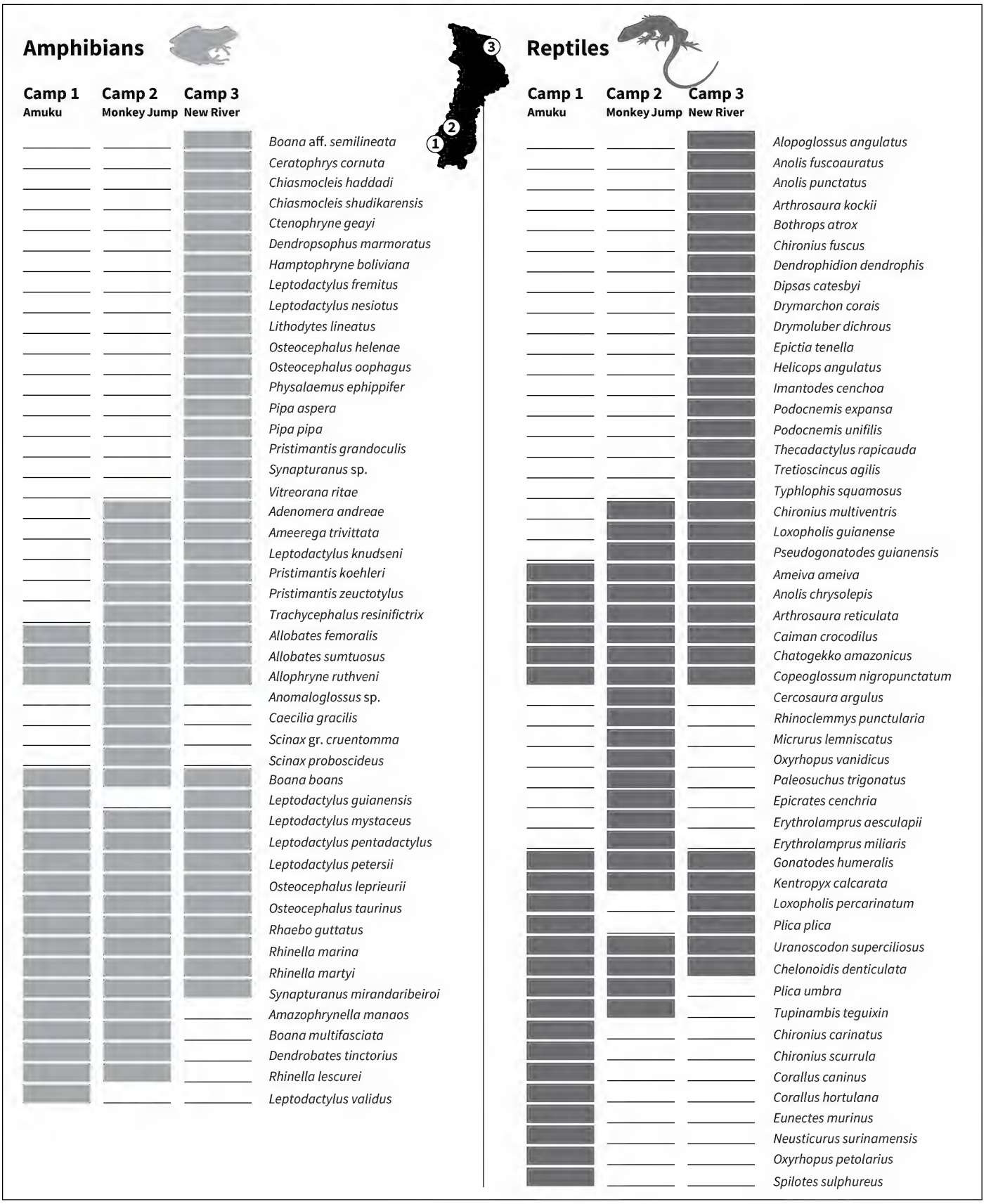
Richness, abundance and composition

Taken together, the examination of the previous record shows that at the time of our inventory 73 species of amphibians and 79 species of reptiles (total = 152 species) were known to occur in southern Guyana and adjacent localities around the ACC (Appendix 4). Obviously, many additional species probably occur, notably the ones that are difficult to detect such as fossorial snakes and caecilians.

Based on the observation of more than 1400 individuals, we recorded 96 species of herpetofauna (47 amphibians and 51 reptiles) belonging to 31 families (full list in Appendix 5). For amphibians, the families Hylidae and Leptodactylidae were the most species-rich (11 species each), followed by Microhylidae (6), Bufonidae (5), Aromobatidae (3), Strabomantidae (3), Dendrobatidae (2), Pipidae (2), and Allophrynidae, Centrolenidae, Ceratophryidae, and Caecilidae (1 each). For lizards, the most species-rich family was Gymnophthalmidae (7 species), followed by Sphaerodactylidae, Dactyloidae, Teiidae, Tropiduridae (3 each), and Alopoglossidae, Phyllodactylidae, and Scincidae (1 each). The most species-rich family of snakes was Colubridae (8), followed by Dipsadidae (7), Boidae (4), and Anomalepididae, Elapidae, Leptotyphlopidae and Viperidae (1 each). Caimans were represented by a single family (Alligatoridae, 2 species), whereas turtles were represented by three: Geoemydidae (1), Podocnemididae (2), and Testudinidae (1).

The rarefaction curve for the observed data (only considering standardized active surveys) exhibits continuous growth (Fig. 31), with no asymptote that would indicate comprehensive community representation. This pattern, as

Figure 32. Variation in amphibian (left) and reptile (right) species richness and composition across the three camps sampled in the Acarai-Corentyne Corridor. Note the higher species richness and number of exclusive species at Camp New River.



well as extrapolation analysis of those curves, confirms that the observed diversity of amphibians and reptiles is largely incomplete. Such underestimation is a direct consequence of the inherent biases associated with brief and non-complementary sampling efforts, underscoring the necessity for further studies in this area.

We observed significant spatial variation in species richness, abundance, and composition across camps (Fig. 32). Camp New River exhibited the highest species richness and abundance, with 70 species and 732 individuals recorded, but we also had an additional sampling day in that camp. In contrast, these features were significantly lower at Camp Monkey Jump, which had 49 species and 425 individuals, and at Camp Amuku, in which 40 species and 320 individuals were recorded. Regarding species composition, 22 species were shared among all three camps, while 18 species were present in at least two camps. The remaining species were unique to single camps: nine species to Camp Amuku, 11 to Camp Monkey Jump, and 35 to Camp New River.

Habitat and microhabitat associations

The species we recorded were often associated with particular microhabitats due to eco-physiological and reproductive restrictions. This includes species typical of temporary ponds (*Hamptophryne boliviana, Ctenophryne geayi*), phytotelmata (*Trachycephalus resinifictrix*, *Osteocephalus oophagus*), upland forests (*Pristimantis zeuctotylus* [Fig. 8A], *Adenomera andreae*, *Chatogekko amazonicus*), palm groves (*Allobates sumtuosus*, *Arthrosaura* cf. *reticulata* [Fig. 8S], *Loxopholis* spp.), streams (*Anomaloglossus* sp. [Fig. 8F], *Neusticurus surinamensis*), and rivers (*Boana boans*, *Vitreorana ritae*, *Uranoscodon superciliosus*, *Chironius carinatus*, *Chironius scurrula*). Several species typical of upland forests were found near the few remaining areas with any wetness, due to the particularly dry conditions. One notable difference in species composition across camps, unrelated to weather conditions, was the presence of three frog species associated with open or disturbed habitats at Camp New River (*Leptodactylus nesiotus*, *Physalaemus ephippifer*, and *Dendropsophus marmoratus*). These species were not highly expected, in particular *Leptodactylus nesiotus*, which was previously only known from the northern half of Guyana. The much higher number of frog species found at Camp New River is also explained by the many species tightly associated with temporary ponds, such as *Chiasmocleis haddadi* (Fig. 8G), *C. shudikarensis*, *Hamptophryne boliviana*, *Ctenophryne geayi*, and *Ceratophrys cornuta*. As most individuals of those species recorded at the site were juveniles, they are likely the result of a reproductive event in a nearby temporary pond during the previous rainy season.

Reproduction

Very few frogs were reproductively active and calling during the sampling. Only *Boana boans* was conspicuously calling at all camps. *Rhinella martyi*, *Boana multifasciata*, *Pristimantis koehleri*, *Trachycephalus resinifictrix*, *Osteocephalus oophagus*, *Leptodactylus pentadactylus*, *Synapturanus mirandaribeiroi*, *Rhaebo guttatus*, and *Rhinella lescurei* were also sporadically calling. Several clutches of *Rhinella martyi* were observed in the puddles left by the drying of small rivers at Camp Amuku and many nests of *Boana boans* were seen along the river banks in all camps. Frog calling activity was significantly higher at Camp Monkey Jump, especially after two short but intense rainfalls.

At that time, *Synapturanus mirandaribeiroi* was notably abundant, actively calling in large numbers across all upland forests. Another distinct call of a *Synapturanus* was recorded during the rainfall, though it was much less frequent than that of *S. mirandaribeiroi*. Unfortunately, we were unable to collect specimens to confirm its identity. However, the call was clearly different from that of *Synapturanus mesomorphus*, the only other species of *Synapturanus* known from Guyana. This evidence suggests the presence of an additional, potentially new species of this genus in the Acarai-Corentyne Corridor.

Other species actively calling at Camp New River particularly after the short rains were *Vitreorana ritae* (the only centrolenid recorded), *Allophryne ruthveni*, *Allobates femoralis*, *Boana* aff. *semilineata, Dendropsophus marmoratus*, *Trachycephalus resinifictrix*, *Leptodactylus pentadactylus*, and *Rhaebo guttatus*. It is also noteworthy that we also found some lizards (*Gonatodes humeralis*, *Chatogekko amazonicus*, *Loxopholis percarinatum*) and one snake (*Dipsas catesbyi*) carrying eggs, indicating that they were recently reproductively active and likely to lay their eggs soon.

Notable records

One remarkable frog we found was a potentially new species for the genus *Anomaloglossus* (Fig. 8F), recorded by two specimens at Camp Monkey Jump. This species belongs to a group in which nearly all members have narrow distributions, and many are classified as threatened by the IUCN. The species we found may correspond to the one documented by Ávila-Pires et al. (2010)

from the Acarai Mountains in nearby Brazil (*Anomaloglossus* sp. Acarai in Vacher et al. 2024), or to the one reported from the Kanuku Mountains by Andrew Snyder (*Anomaloglossus* sp. Kanuku; A. Snyder, personal communication).

Another notable record was the lizard *Arthrosaura* cf. *reticulata* (Fig. 8S), observed at all three camps. *Arthrosaura reticulata* is recognized as a species complex, with populations in nearby Suriname and French Guiana suspected to represent undescribed species. Based on the morphological variation we observed, we suspect that at least some of the specimens we recorded may belong to these undescribed species.

Six of the named species found in the Acarai-Corentyne Corridor are new records for Guyana. This is the case for the frogs *Chiasmoleis haddadi*, *Leptodactylus fremitus*, *Pristimantis grandoculis*, *Rhinella lescurei* (Fig. 8B), and *Pipa aspera* (recorded via eDNA), and the lizard *Arthrosaura kockii*. Those species seem to reach their range limits within the Acarai-Corentyne Corridor, and are probably absent from the northern half of Guyana. Finally, some of the species we recorded are also noteworthy because they are fossorial and generally difficult to collect, such as the small scolecophidian snakes *Epictia tenella* (Fig. 8H) and *Typhlophis squamosus*, and the microhylid frog *Synapturanus mirandaribeiroi* (Fig. 8D).

eDNA sampling

Environmental DNA detected 17 amphibian species and eight reptiles. Four amphibians (*Hyalinobatrachium iaspidiense*, *Boana xerophylla*, *Leptodactylus macrosternum* and *Pipa aspera*) and three reptiles (*Rhinoclemmys punctularia*, *Chelus fimbriata*, *Podocnemis expansa*) were only detected by eDNA. For more details on eDNA detections of reptiles and amphibians see the *eDNA* chapter on page 151.

DISCUSSION

Our results confirm that the Acarai-Corentyne Corridor harbors a high number of amphibian and reptile species, and that this number remains significantly underestimated due to sampling biases. The recorded communities are composed of diverse functional groups (from different microhabitats or having distinct reproductive modes and diets), including apex predators such as snakes and caimans. Therefore, from the perspective of the amphibians and reptiles, the habitats in this area remain well-preserved, as does the integrity of the ecological relationships within the ecosystem.

Richness, abundance, and composition

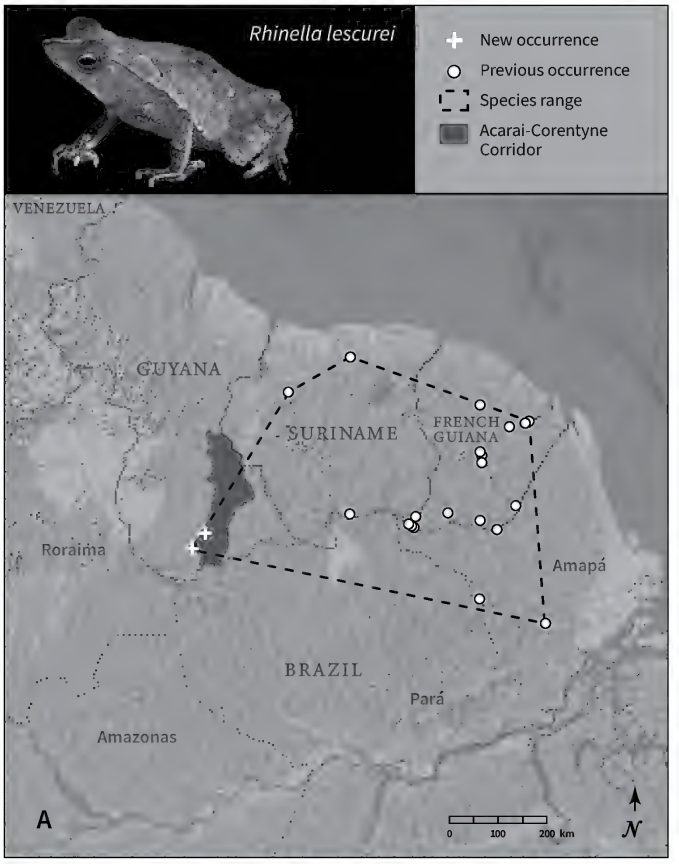
Although we observed variation in species richness, abundance, and composition across the camps, these cannot be separated from the sampling bias associated with a short survey conducted during a single annual period. The extremely dry conditions encountered, particularly at the first two camps, likely played a significant role in shaping the observed patterns for these parameters.

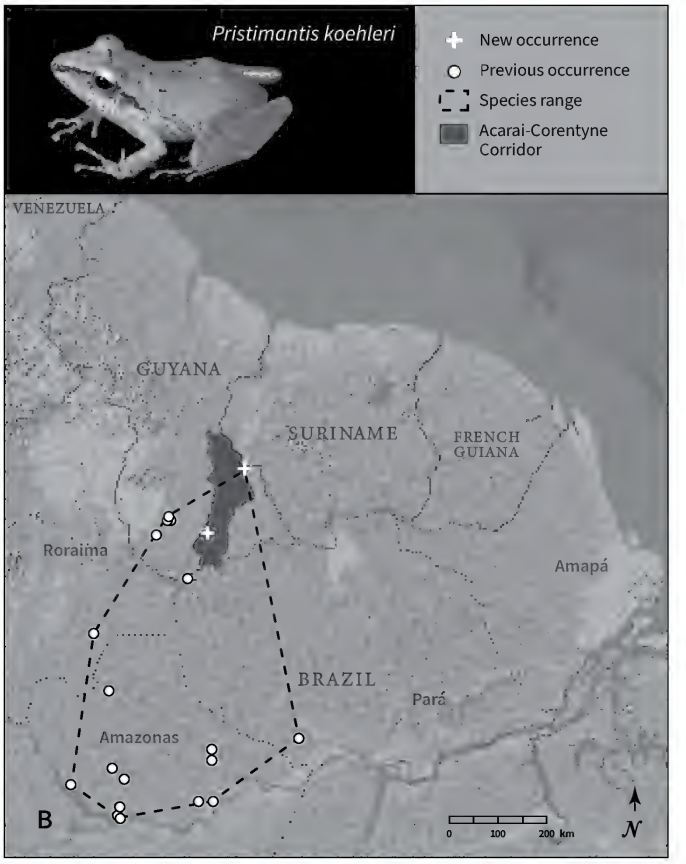
It is also noteworthy that we did not sample any upland habitats above 400 m above sea level, notably the uplands of the Amuku Mountains at Camp Amuku. The survey of upland forest above 400 m could possibly yield additional narrow-ranged species such as those associated with rocky streams (*Anomaloglossus* spp., *Rhinatrema* spp.) and cooler environments (*Pristimantis* spp.). These upland herpetofauna communities have only been explored during the dry season in the Acarai Mountains at sites outside the Acarai-Corentyne Corridor by Ávila-Pires et al. (2010) and Señaris et al. (2008), in the second case only below 300 m above sea level. Likewise, during the inventory we did not visit rocky outcrops where other typical species could occur (such as the frogs *Leptodactylus myersi*, *Leptodactylus longirostris*, and *Adenomera hylaedactyla,* and the lizard *Tropidurus hispidus*), nor any savannas that are present near the Acarai-Corentyne Corridor (likely with associated specialists such as the frogs *Pithecopus hypochondrialis*, *Pseudopaludicola* spp., and *Scinax nebulosus*, and the lizard *Anolis auratus*). Further inventories in the Acarai-Corentyne Corridor, covering additional periods of the seasonal climatic cycle, are necessary to provide a more comprehensive understanding of these patterns.

The low number of amphibian species we recorded (47 spp.) can be largely explained by the dry conditions encountered during the entire survey. The habitat diversity, notably at Camp Amuku with the presence of a nearby massif reaching >700 m above sea level, upland and white-sand forests, palm groves, and the already documented presence of many species associated with particular microhabitats, suggest that this region harbors a much higher amphibian richness than we were able to document. The data from inventories undertaken in the surrounding areas strengthen that proposition, as we did not encounter many expected species, notably hylid, phyllomedusid, and centrolenid treefrogs. A nearby locality in Suriname (Sipaliwini), which is relatively similar in terms of habitat variation, was surveyed during 13 days and led to a list of 72 forest species (Fouquet et al. 2015).

Our list of lizards, turtles, and caimans, with 27 species of the 46 reported for the region, can be considered as

Figure 33. Range maps showing examples of frog species having an eastern (a; *Rhinella lescurei*) and southern (b; *Pristimantis koehleri*) distribution in the Guiana region. Six other frogs recorded during the inventory are eastern-distributed (*Chiasmocleis haddadi, Pipa aspera, Dendrobates tinctorius, Leptodactylus fremitus, Pristimantis grandoculis,* and *Scinax proboscideus*), while two frogs (*Allobates sumtuosus* and *Amazophrynella manaos*) and one lizard (*Chatogekko amazonicus*) are southern-distributed.





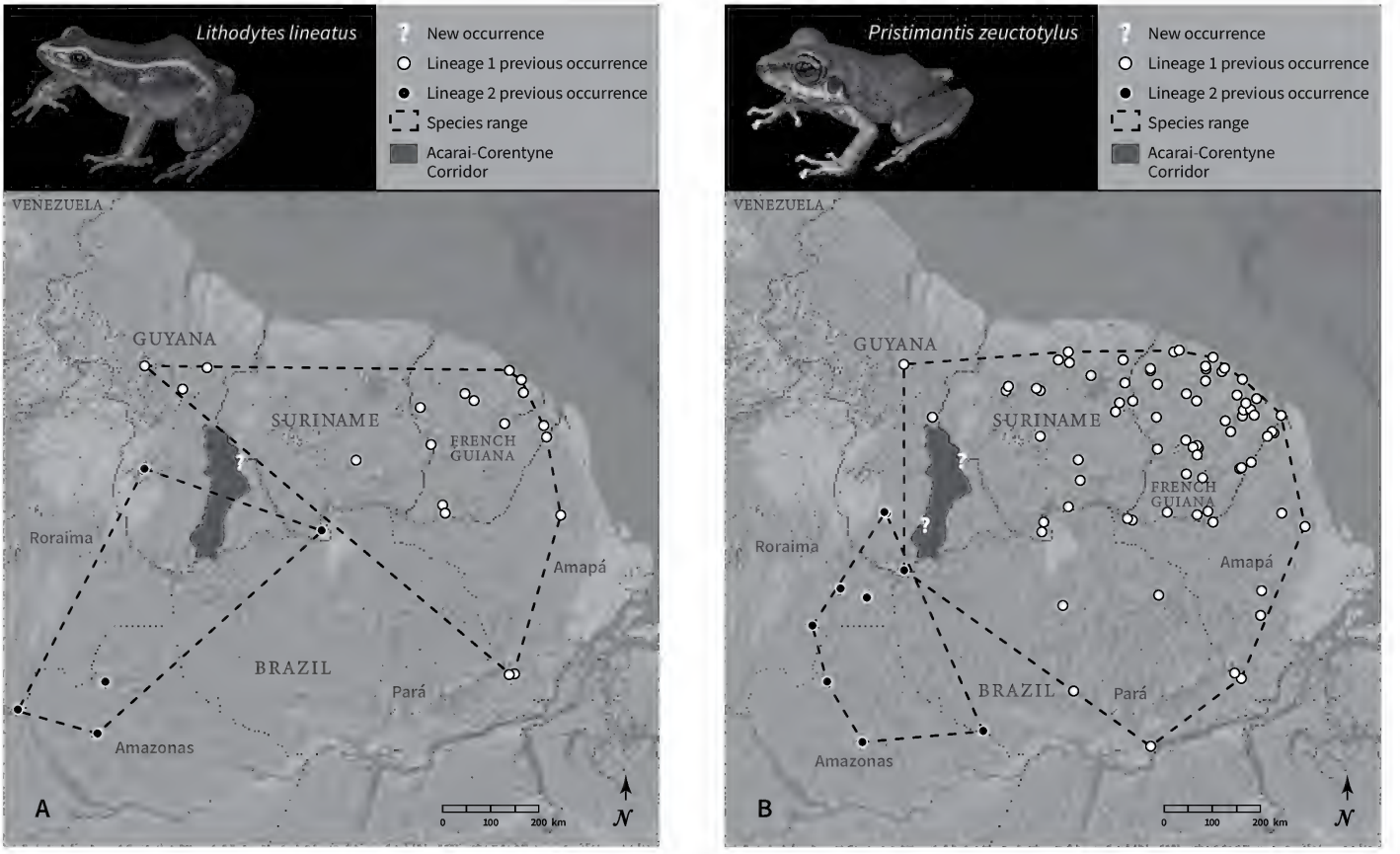
representative. We recorded many species of leaf litter-associated lizards (alopoglossids, gymnophtalmids and sphaerodactylids), which are secretive and usually difficult to sample with active surveys. However, we missed some common Amazonian lizard species such as *Iguana iguana* and open-habitat species such as *Anolis auratus*, *Kentropyx striata,* and *Chelonoidis carbonaria*. For snakes, although we recorded some rarely seen species, such as the fossorial blindsnakes, our list of 23 species can be considered very incomplete. This is an expected result because these animals are difficult to sample given their naturally low abundances and secretive habits, and a good representation of the snake communities usually requires long-term field surveys. Based on the literature, the actual snake richness in the Acarai-Corentyne Corridor may exceed 80 species (Nogueira et al. 2019).

Although we found a relatively low richness of frogs and snakes, we nevertheless recorded 24 species that were not included in the list of expected species for the region (12 amphibians and 12 reptiles), which again suggests that this list was overly conservative. Another 81 herpetofauna species (40 amphibians and 41 reptiles) were highly expected to occur in the Acarai-Corentyne Corridor based on the results of nearby inventories from the New River, Kanashen Amerindian Protected Area, and the Acarai Mountains. Therefore, this Corridor may harbor >178 species for these groups (86 amphibians and 92 reptiles). Such alpha diversity is in line with similar-sized areas throughout Amazonia, and amongst the highest in the world (Luedtke et al. 2023).

Range limits and the singularity of southern Guyana

Our findings improve our general understanding of the biogeographic context in which the Acarai-Corentyne Corridor is located and thus its particularities at the national scale and across the eastern lowlands of the Guiana Shield (Guiana region). Some of the recorded species represent range extensions and/or new records for Guyana, such as the eastern-distributed frogs *Chiasmocleis haddadi* (Fig. 8G), *Leptodactylus fremitus*, *Rhinella lescurei* (Fig. 33A), and *Pipa aspera* (eDNA) and the lizard *Arthrosaura kockii*. Our results thus extend the ranges of those species westward, at least to the right bank of

Figure 34. Range maps showing the distribution of genetic lineages (16S mtDNA) within two frog species as examples (a: *Lithodytes lineatus*; b: *Pristimantis zeuctotylus*). These distinct lineages may represent distinct species that meet somewhere within the Acarai-Corentyne Corridor. Our new records for those species (red question marks) will allow a determination of their genetic identities in this region.



the Essequibo River. Other frog species such as *Pristimantis grandoculis*, which was previously documented on the Brazilian side of the Acarai Mountains (as *Eleutherodactylus marmoratus* in Ávila-Pires et al. [2010]), and *Pristimantis koehleri* (Figs. 8E, 33B), known from a few nearby localities in northern Brazil and southern Guyana, had their ranges extended northward based on our sampling. Conversely, the frog *Leptodactylus nesiotus* is a species mostly known from the northern coast of South America, and from a single record near the Berbice River (>100 km north of the Acarai-Corentyne Corridor). Our record of this species thus represents a southward range extension. Finally, our records of *Anomaloglossus* sp. (Fig. 8F), *Synapturanus* sp., and *Arthrosaura* cf. *reticulata* (Fig. 8S) also probably represent new localities but these taxa belong to species complexes and most probably represent undescribed species. Therefore, a total of six named herpetofauna species and three possible undescribed ones are reported here for Guyana for the first time.

At least 13 of our recorded species present a range limit within Guyana, as they have never been recorded in the northern part of the country. This includes the aforementioned frogs and lizards at their range limits, plus the frogs *Dendrobates tinctorius* (Fig. 8C), *Pristimantis zeuctotylus* (Fig. 8A), *Synapturanus mirandaribeiroi*, and *Adenomera andreae* and the lizard *Chatogekko amazonicus*. Together these new data highlight the faunistic singularity of southern Guyana as compared to the northern half of the country.

On a larger regional scale, our records confirm that the Acarai-Corentyne Corridor lies at the intersection of two major areas that have distinct frog species composition (bioregions): one in the east (Brazil's Amapá state, French Guiana, and Suriname) and one in the south (northern part Brazil's Amazonas and Pará states; Fig. 34). This pattern also applies to species that have a pronounced genetic structure across the Guiana region, which suggests the existence of undescribed species. This is notably the case for *Leptodactylus petersii, Lithodytes lineatus*, and *Pristimantis zeuctotylus* (Fig. 34). Further genetic analyses will determine whether populations in the Acarai-Corentyne Corridor correspond to the eastern or southern lineages. This pattern was already documented for anurans by Vacher et al. (2020) and probably results from current and historical environmental heterogeneity.

Local ecological knowledge

The herpetology team was impressed by the knowledge that local people had of the amphibians and reptiles of the area. For example, they knew exactly where to find the poison frog *Dendrobates tinctorius*, *kipi kipi* in Waiwai (Fig. 8C), a species with a striking blue color pattern but occurring in very patchy populations associated with mature forest on hills.

Even before we could reach a favourable spot at camps Amuku and Monkey Jump, local colleagues already brought us these frogs and later showed us the area where they occur. Another illustration of their deep understanding of these secretive animals came with regard to specimens of the aquatic frog *Pipa pipa* at Camp New River. This frog, named *kuxpa* in Waiwai, was well known by the local teams at each camp, where they knew favorable habitat sites, i.e., non-flowing parts of the river and ponds forming along the floodplain. A last example of the deep understanding of the biotic communities that local experts have is the absence of fear of the non-venomous snakes that we captured with their help at night by boat. They spotted two species of tree boas (genus *Corallus*) and a false coral snake (*Oxyrhopus petolarius*) well before us and, even though the boas are conspicuously aggressive, they helped us twist the nearby branches, placing their hands a very short distance from the snakes.

Conservation

The singularity of southeastern Guyana's amphibian and reptile fauna has important implications for conservation on a national scale. It underscores the need for distinct areas across the country to be protected in order to maximize the number of species under conservation. Establishing a protected area in the Acarai-Corentyne Corridor would undoubtedly contribute significantly to preserving a substantial portion of southern Guyana's herpetofauna.

Furthermore, the convergence of two distinct frog bioregions in southern Guyana indicates that the Acarai-Corentyne Corridor harbors a transition zone with the potential to enhance regional biodiversity conservation efforts.

At the scale of the Guiana region, we recorded two frogs (*Anomaloglossus* sp. [Fig. 8F] and *Synapturanus* sp.) and one lizard (*Arthrosaura* cf. *reticulata* [Fig. 8S]) that are likely new to science. These three species are probably narrowly distributed in southern Guyana and adjacent areas. Other narrowly distributed species may also inhabit the region, particularly in isolated massifs, such as caecilians of the genera *Rhinatrema* and *Microcaecilia*, as well as potential additional species of *Anomaloglossus*.

The Acarai-Corentyne Corridor also harbors populations of species considered globally vulnerable to extinction by the IUCN, such as the turtles *Podocnemis unifilis* and *Chelonoidis denticulata* (Fig. 8Q), along with species threatened by poaching, such as caimans and turtles, and those targeted for the pet trade, such as the blue poison frog (*Dendrobates tinctorius* [Fig. 8C]). Preserving this area is critical for safeguarding both the described and undescribed diversity of amphibians and reptiles in southern Guyana.

BIRDS

Authors: Cameron Rutt, Asaph Wilson, Kwang Suse, and Douglas F. Stotz

Conservation targets: Breeding populations of apex predators (large eagles of the genera *Harpia* and *Morphnus*), large numbers of popular trade birds (*Ara* macaws and *Amazona* parrots), healthy populations of important game species (tinamous, guans, curassows, and trumpeters), and a refuge for terrestrial and near-ground insectivores, guilds for which there is some evidence that declines may be widespread, even in 'pristine' Amazonian rainforest; an immense tract of undisturbed, intact, and continuous rainforest, free of roads and other human infrastructure, offering high-quality habitat for forest birds; at least six species of conservation concern: White-rumped Sandpiper (*Calidris fuscicollis*; Vulnerable), Semipalmated Sandpiper (*Calidris pusilla*; Near Threatened), Agami Heron (*Agamia agami*; Near Threatened), Crested Eagle (*Morphnus guianensis*; Near Threatened), Harpy Eagle (*Harpia harpyja*; Vulnerable), and Ornate Hawk-Eagle (*Spizaetus ornatus*; Near Threatened); other expected species of conservation concern, not detected on this inventory, include Gray-bellied Hawk (*Accipiter poliogaster*; Near Threatened) and Blackpoll Warbler (*Setophaga striata*; Near Threatened)

INTRODUCTION

Although the avifauna of this region can be largely inferred to comprise upland (*terra firme*) birds of the Guianan area of endemism, remarkably few ornithological studies have been conducted within this region. In fact, only a single inventory surveyed birds within the Acarai-Corentyne Corridor (New River and the Acarai Mountains; Blake 1950). However, five additional surveys have occurred in similar habitats nearby: the upper Essequibo River and western Acarai Mountains (Robbins et al. 2007), the upper Rewa River (Pickles et al. 2011), the southern Acarai Mountains in Brazil (Aleixo et al. 2011), the Kwamalasamutu region of southwestern Suriname (O'Shea and Ramcharan 2012), and the upper Berbice River (O'Shea 2018). The former Upper Essequibo Conservation Concession, in the

northwest of the corridor, contains only a preliminary list of birds (33 species and genera; CI-Guyana 2013).

Together, these first six surveys form the basis of our regional expectations for avian diversity and species composition in the Acarai-Corentyne Corridor: 156 species (Blake 1950), 440 species (Robbins et al. 2007), 248 species (Pickles et al. 2011), 203 species at the 'Grão-Pará North' site (Aleixo et al. 2011), 327 species (O'Shea and Ramcharan 2012), and 271 species (O'Shea 2018). Setting aside the 42 species that were detected only at Gunns Strip (Robbins et al. 2007)—a seasonally flooded natural savanna just southwest of the corridor, which is unique within this region—the cumulative species list from these six surveys amounts to 431 species. We had also removed birds that were only reported from the village of Kwamalasamutu (O'Shea and Ramcharan 2012) and the 'White Sands camp' along the upper Berbice River (O'Shea 2018), as these habitats are not present within the corridor. Beyond the lowland *terra firme* avifauna of the Guianas, ~20 species of primarily montane birds have been found in the Acarai Mountains.

In this inventory, we aimed to record as many species as possible within the Acarai-Corentyne Corridor and, by integrating our survey effort with prior regional surveys, provide baseline estimates for the total number of species likely to occur within the corridor.

METHODS

We primarily sampled birds for 4–6.5 days at each camp: five days at Camp Amuku (6–10 November 2024), four days at Camp Monkey Jump (12–15 November 2024), and 6.5 days at Camp New River (18–24 November 2024) for a total of 15.5 sampling days. To this we added opportunistic observations during three days of river travel, avian bycatch from the mammal camera traps, taxa detected by environmental DNA (eDNA) and observations from the advance team. For a map of the study area and description of sites, see Fig. 4 and the *Regional panorama* chapter on page 89. Information on audio recorder, camera trap, and eDNA sampling locations are provided at https://doi.org/10.5061/dryad.m0cfxppg5.

The bird sampling protocol mainly consisted of extended hiking transects, anchored to the trail system at each camp, but with the flexibility to pursue diverse mixed-species flocks off trail. Broadly, our objectives were to maximize the combined area surveyed each day, walk the entire trail system at every camp, and ensure that we covered all available habitats. Surveys typically began at dawn and continued through the early afternoon, resulting in ~9-hour days of fieldwork (roughly 04:45–13:45). Across three weeks of sampling at our three camps, sunrise shifted subtly between 05:35–05:38, with the first diurnal birds tuning up for the dawn chorus at ~05:10. To maximize coverage, Asaph Wilson and Cameron Rutt typically surveyed separate trails (or separate sections of the same trail) on any given day, taking care to sample the dawn chorus at unique locations. After the first morning at Camp Amuku, where the three of us birded together, Kwang Suse joined Asaph Wilson for all but the first days at Camp Monkey Jump and Camp New River. The tandem of Asaph and Kwang typically completed an entire trail in a single outing (5–8 km), while Cameron's crawling pace meant that he often only covered ~1.5–2 km of trail (~3–4 km out and back). Weather did not influence any of our fieldwork, and we faced only a single morning with substantial tree drip from rainfall the previous evening.

All bird observations, locations, and automated GPS tracks were recorded using eBird Mobile and a joint eBird account (username: Field Museum RI32), which was originally blocklisted from public output before being activated once the embargo period was lifted. These checklists primarily took the form of 'traveling' and 'stationary' counts and, at the end of each field day, Cameron compiled additional opportunistic observations from the camp into a single 'incidental' checklist, to ensure that all unique sightings from the day were logged. Wherever possible, we attempted to document unusual and charismatic species with either recordings on Merlin Bird ID (all members) or, for Cameron, a mirrorless camera (Canon EOS R5 Mark II) and telephoto lens (Canon RF100-500 mm) and/or a digital field recorder (Zoom F3) and shotgun microphone (Audio-Technica 8015). For many of the remaining species, we also archived photos and audio recordings at the Macaulay Library, which serve as publicly accessible, digital vouchers of these species within the corridor. Taxonomy and nomenclature follow the eBird/Clements Checklist of Birds of the World (Clements et al. 2023).

For the first time on a Field Museum-led rapid inventory, the advance team deployed 15 autonomous recording units (ARUs; Song Meter Micro 2)—five at each camp—to both document and archive the soundscapes at these remote, undisturbed sites (Fig. 9G). All devices were deployed at least 500 m apart. These units began recording immediately after deployment, resulting in 12–28 days of sampling at each camp prior to our arrival (shortest at Camp Monkey Jump and most protracted at Camp New River). At the start of Camp Amuku and Camp Monkey Jump, Cameron collected the ARUs and relocated them elsewhere along the trail system (for three additional days of sampling, on average), enabling us to sample

24 unique soundscapes in all. Due to technical difficulties at Camp New River, we were unable to repeat this redeployment procedure there.

Individual devices recorded a continuous three-hour time block every morning—one hour prior to sunrise until two hours after sunrise (with a sampling rate of 48 kHz, above the threshold for human hearing). Once properly formatted, all soundscapes will be archived in the Macaulay Library and run through Sound ID. At this time, Sound ID is able to identify 41% of birds in this region, but permanent archiving means that these recordings can be reanalyzed again and again as Sound ID becomes increasingly proficient with Neotropical birds.

Two additional technologies also provided unique contributions of bird documentation. First, the camera trap work by the mammal team allowed us to detect shy terrestrial birds. This large-scale effort (2537 trap-nights at 131 locations) predominantly targeted medium- to large-bodied terrestrial mammals, but camera traps routinely capture photos and videos of game birds, in particular. For a more detailed description of methods and sampling effort, see the *Mammals* chapter on page 138. Second, making its debut on a rapid inventory, eDNA collected from water samples was employed to detect vertebrates of all kinds, including birds. For a detailed description of those methods, please refer to the *eDNA* chapter on page 151.

Lastly, other team members opportunistically contributed bird sightings. Álvaro del Campo was particularly helpful with his knowledge of macaw and amazon vocalizations. And thanks to the nocturnal nature of herpetological fieldwork, Leandro Moraes routinely surveyed for owls and potoos during the early hours of each night. No bird specimens were collected.

RESULTS AND DISCUSSION

We found 339 species of birds across our three camp stays and three days of river commutes (Appendix 6). Sixteen of these species were only seen from our days of boat travel along the Essequibo River, two were detected only eDNA, and another was detected only by camera traps (Gray-cowled Wood-Rail [*Aramides cajaneus*]). Taking into account the six other regional surveys from Brazil, Suriname, and southern Guyana, we predict a preliminary baseline threshold of 445 species of birds for the Acarai-Corentyne Corridor. This diversity is high —more than half of Guyana's bird diversity—but also expected for species-rich upland rainforests within the Guianan area of endemism. For more context, this avian diversity is among the highest on Earth (e.g., Jenkins et al. 2013, Lumbierres et al. 2022), comparable to that recorded elsewhere in the central Amazon—352 species in seven years of fieldwork north of Manaus (Stotz and Bierregaard 1989)—but not as high as areas in the western Amazon, which appear to benefit from both higher alpha diversity and greater habitat heterogeneity. For example, a suite of six representative rapid inventories from Peru registered 349–394 species (median = 270 species per camp); in contrast, this inventory yielded results more similar to that of Ere-Campuya-Algodón in Peru (320 species, with an average of 236 species per camp), which only sampled sites on poor soil (Stotz and Ruelas Inzunza 2013). At the national scale, this avian diversity should match or exceed that found in any other homogenous habitat throughout Guyana.

Species richness at the camps

We detected a similar number of species at each of our three camps (mean = 246 species), with minor deviations tracking sampling effort: 250 species at Camp Amuku (5 days), 233 species at Camp Monkey Jump (4 days), and 254 species at Camp New River (6.5 days). In surveying a hyperdiverse bird community like this, there are two principal processes at play. The first is space to accumulate sufficient habitat heterogeneity, providing exposure to all of the potential forest types and microhabitats. And the second is time, allowing us to continue to detect rare and uncommon members of the most diverse bird community (mature upland rainforest). Although we had access to mature upland rainforest at all three camps, it was most extensive and accessible at Camps Monkey Jump and New River. By the end of our stay at Camp New River, we had detected the vast majority of upland rainforest birds expected for the corridor. There were no signs of recent human disturbances at each of our camps (e.g., no pastures or secondary forest from clearcuts), but each camp had avian habitats that were distinct within our three-week inventory.

The two most striking avian habitats at Camp Amuku were the presence of stunted pole forest, which ornithologists elsewhere might characterize as *campinarana* (i.e., forests atop nutrient-poor soils such as white-sand forest). This was particularly evident along the western portion of Trail N. Here, we found numerous Bronzy Jacamars (*Galbula leucogastra*), Amazonian Antshrikes (*Thamnophilus amazonicus*), and Saffron-crested Tyrant-Manakins (*Neopelma chrysocephalum*), although the real prize was a singing Pelzeln's Tody-Tyrant (*Hemitriccus inornatus*; see below for more details). A Black Manakin (*Xenopipo atronitens*) was also seen nearby on Trail F. The other unique landscape feature was elevation, as we were able to ascend the western tip of the Amuku Mountains

(~700 m). At this elevation, however, the forest appeared undifferentiated from typical mature upland rainforest, without any stunted vegetation, rocky outcroppings, or inselbergs. We only had access to this elevation for 1 km on a single morning, but still managed four of the anticipated montane additions: Collared Trogon (*Trogon collaris*), Tepui Toucanet (*Aulacorhynchus whitelianus*), Tepui Vireo (*Vireo sclateri*), and Tropical Parula (*Setophaga pitiayumi*).

At Camp Monkey Jump, the presence of both standing water and flowing streams *within* the forest was an obvious (and welcome) departure from Camp Amuku. This and the appearance of a *Mauritia* palm swamp, embedded inside upland rainforest, brought with it Pale-tailed Barbthroat (*Threnetes leucurus*), Silvered Antbird (*Sclateria naevia*), and consistent Black-throated Antbirds (*Myrmophylax atrothorax*) and Palm Tanagers (*Thraupis palmarum*). Extensive seasonally flooded forest also provided our only Cayenne Jays (*Cyanocorax cayanus*) for the expedition.

At the other corner of the corridor, the most distinctive avian feature of the Camp New River landscape was second-growth vegetation. We found a suite of disturbance-loving species here, birds that prefer overgrown clearings, dense thickets, and vine tangles. This includes our only registers for Great Antshrike (*Taraba major*), Dot-winged Antwren (*Microrhopias quixensis*), Ochre-bellied Flycatcher (*Mionectes oleagineus*), Helmeted Pygmy-Tyrant (*Lophotriccus galeatus*), Boat-billed Tody-Tyrant (*Hemitriccus josephinae*), Buff-breasted Wren (*Cantorchilus leucotis*), Silver-beaked Tanager (*Ramphocelus carbo*), and Buff-throated Saltator (*Saltator maximus*). These last three species, for instance, are common residents of gardens and urban parks.

In Appendix 6, we tally the number of daily occurrences for each species at every camp.

Notable records

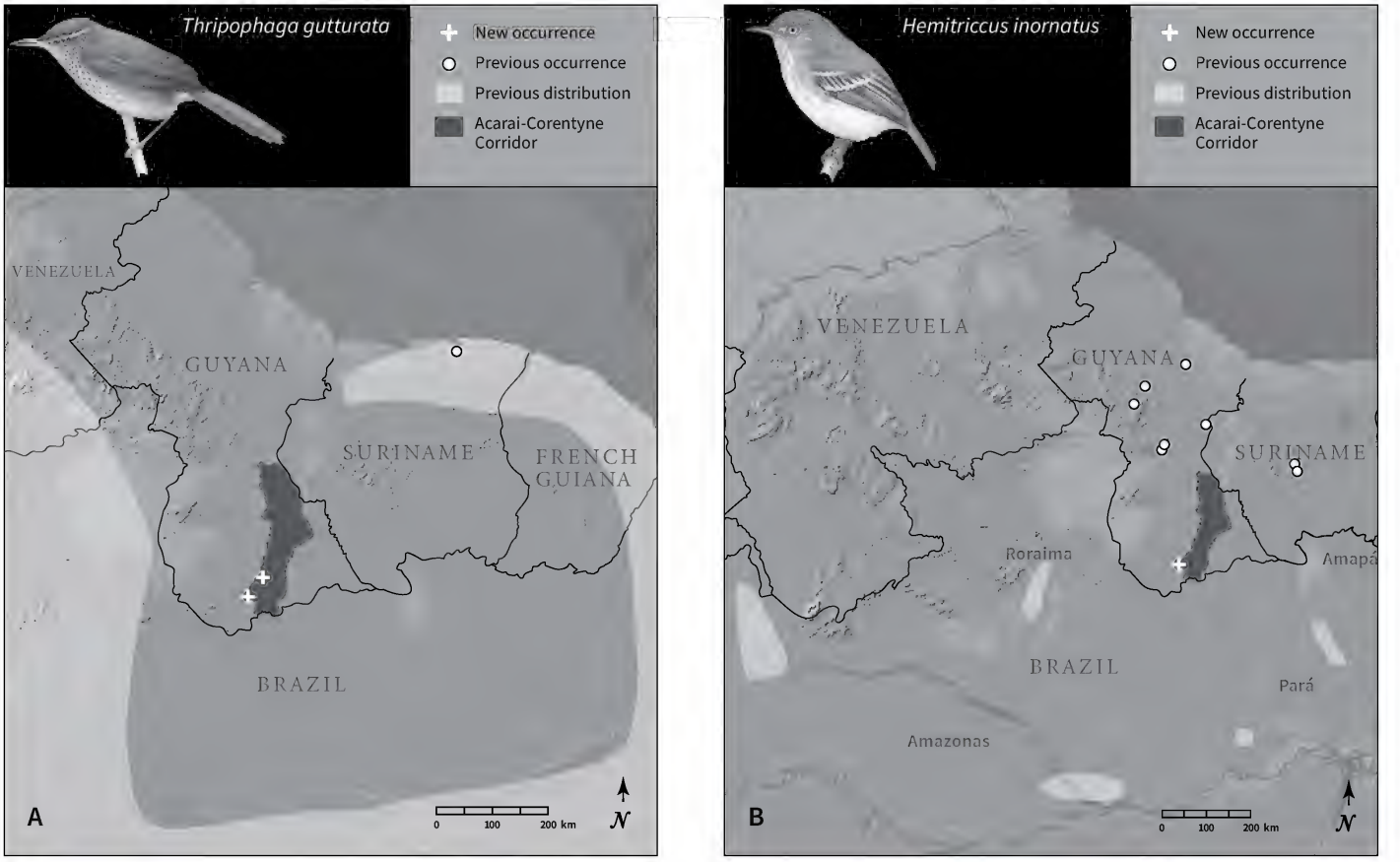
We found 14 species that were not detected during any of the six surrounding surveys in the region. Most of these were waterbirds and/or boreal migrants, but two resident forest birds deserve special attention here, as they were not included in the second edition of *A Field Checklist of the Birds of Guyana* (Braun et al. 2007): Speckled Spinetail (*Thripophaga gutturata*) and the aforementioned Pelzeln's Tody-Tyrant (*Hemitriccus inornatus*). We found Speckled Spinetails at both Camp Amuku and Camp Monkey Jump, often in the company of *Thamnomanes* antshrike-led understory mixed-species flocks. We even watched as one Speckled Spinetail, right beside our physical camp at Camp Amuku, constructed its globular nest (Fig. 9D) while the flock passed nearby. Although widespread across Amazonia, there are no Guyana records for this species in either eBird or the Global Biodiversity Information Facility (GBIF) and the species is not mapped for this region, so this appears to represent a first country record (Fig. 35A). Elsewhere in the Guianas, Speckled Spinetails are considered rare (Tostain et al. 1992, Spaans et al. 2016).

The second species, Pelzeln's Tody-Tyrant, was first documented in Guyana in 2010, during the Amaila Falls Environmental and Social Impact Assessment (Exponent 2011). More recently, it has been found in white-sand forest along the Upper Berbice River (2014; O'Shea 2018), most frequently in white-sand forest at Iwokrama Forest, as well as Kaieteur International Airport (Fig. 35B). In Suriname, it is known only from the Kappel Savanna within the Central Suriname Nature Reserve (Spaans et. al 2016), where there were two definitive records through 2009 (Ottema et al. 2009). This local, poorly known species is primarily known from disparate sites in northern Brazil and was lost to science for 161 years before being rediscovered in 1992 (Whittaker 1994).

We also provide some of the first documentation for Black-whiskered Vireo (*Vireo altiloquus*; Fig. 9L) in Guyana, a boreal migrant that breeds primarily on Caribbean islands. Within the country, there are currently no photographed records in eBird and only a single specimen in GBIF (29 September 1997 at Turtle Mountain in Iwokrama). Cameron photographed what were likely multiple individuals in the canopy of a popular fruiting tree at Camp Monkey Jump (Fig. 9L), on a date (15 November 2024) that seems likely to suggest wintering birds and not southbound transients.

Amazingly, we encountered three of the rare, large eagles in less than three weeks' time: one Harpy Eagle (*Harpia harpyja,* Fig. 9E) and two Crested Eagles (*Morphnus guianensis,* Fig. 9A). Even more remarkable, we found both an adult Harpy and Crested Eagle within the same morning (~15 km apart), as we traversed up the Essequibo River from Camp Monkey Jump to Camp Amuku. The second Crested Eagle, also an adult, was photographed still-hunting from the subcanopy of upland rainforest at Camp New River (Fig. 9F). Eagles represented three of the six globally threatened or near threatened birds that we detected: Harpy Eagle (Vulnerable), Crested Eagle (Near Threatened), Ornate Hawk-Eagle (*Spizaetus ornatus*; Near Threatened), White-rumped Sandpiper (*Calidris fuscicollis*; Vulnerable), Semipalmated Sandpiper (*Calidris pusilla*; Near Threatened), and Agami Heron (*Agamia agami*; Near Threatened). We detected Ornate Hawk-Eagles on nine

Figure 35. New occurrence records for the Speckled Spinetail (*Thripophaga gutturata*) and Pelzeln's Tody-Tyrant (*Hemitriccus inornatus*) in the Acarai-Corentyne Corridor. Prior occurrence data were synthesized from georeferenced records in a suite of online biodiversity databases (eBird, Xeno-canto, iNaturalist, GBIF, and VertNet), but only for Guyana and Suriname. Specimen records are limited to only those that were digitized and archived at GBIF or VertNet. Distributional polygons come from BirdLife International and Handbook of the Birds of the World (2024). Bird illustrations from ©Birds of the World | Cornell Lab of Ornithology (Tim Worfolk and Hilary Burn).



field days (and one travel day), which equates to 60% of our field sampling effort.

Game birds

We found apparently plentiful populations of important game species, which indicate very low to nonexistent hunting pressure as well as opportunities for sustainable, low-impact hunting. This was particularly evident at Camp Monkey Jump and Camp New River. Out of 15 full sampling days at the three camps, we found the following game species on 10 or more days: Great Tinamou (*Tinamus major*; 13 days), Variegated Tinamou (*Crypturellus variegatus*; 13 days), Marail Guan (*Penelope marail*; 10 days; Fig. 9N), Black Curassow (*Crax alector*; 11 days), Marbled Wood-Quail (10 days), and Gray-winged Trumpeter (*Psophia crepitans*; 13 days; Fig. 9H). Trumpeters and curassows were by far the most frequently detected birds in the camera trap data, with more than half of all occurrences at Camp New River (Table 9).

Our conversations with residents from Masakeñarî and Parabara indicate that Black Curassow is by far the most important game bird, followed by other large species such as tinamous, guans, toucans, and macaws. In a systematic, yearlong survey of subsistence hunting (2014–2015), Waiwai hunters in Kanashen Amerindian Protected Area (KAPA) were estimated to harvest 324 individual birds: 168 Black Curassows (52% of all birds), 51 macaws (*Ara* spp.), 33 presumably Marail Guans, 27 toucans (*Ramphastos* spp.), 24 Gray-winged Trumpeters, and 21 Great Tinamous (Shaffer et al. 2017). This places the Black Curassow second only to the lowland paca (*Cuniculus paca*; 198 individuals per year), although all birds combine for a small percentage of overall biomass (6%), in contrast to ungulates, primates, and rodents (Shaffer et al. 2017).

Terrestrial insectivores

In recent years, alarming evidence has accumulated that two guilds of forest-dependent birds, in particular, are declining

even in undisturbed ('pristine') Amazonian rainforest: terrestrial and near-ground insectivores. Although few long-term monitoring sites exist in the Neotropics, recent declines for these guilds have been demonstrated at three of the four sites: Manaus, Brazil (Stouffer et al. 2021), eastern Ecuador (Blake and Loiselle 2024), and central Panama (Pollock et al. 2022), but not southeastern Peru (Martínez et al. 2023). Given this evidence, access to new regions of remote rainforest, far from any human infrastructure, provide a unique and important window to examine the presence or apparent rarity of the constituent species.

Within the Acarai-Corentyne Corridor, we found two-thirds of the species in these two guilds (14 of 21): six of the 10 available terrestrial insectivores and eight of 11 available near-ground insectivores (see Table S1 of Stouffer et al. 2021 for guild assignments). It was especially encouraging to find the following three species at every camp, as these were among the species with the steepest declines in primary rainforest at Manaus (see Fig. 2a in Stouffer et al. 2021): Rufous-bellied Antwren (*Isleria guttata*) was detected on nine of 15 sampling days (60%), Wing-banded Antbird (*Myrmornis torquata*) on four days (27%), and Musician Wren (*Cyphorhinus arada*) on nine days (60%). Notably, multiple individuals of Wing-banded Antbird were found on four of six observations, including a male-female pair and two nearby males, both singing during the dawnsong. For Musician Wren, we had at least five separate observations of presumed family groups (3–4 individuals together).

On the other hand, it was noteworthy that we did not detect Chestnut-belted Gnateater (*Conopophaga aurita*), Variegated Antpitta (*Grallaria varia*), any of the three *Sclerurus* leaftossers, Ruddy Foliage-gleaner (*Clibanornis rubiginosus*), or Wing-banded Wren (*Microcerculus bambla*). Missing Variegated Antpitta and Wing-banded Wren were especially striking as these two species were found on five of six and four of six regional surveys, respectively. In contrast, Spotted Antpitta (*Hylopezus macularius*) was heard singing on all but one of the sampling days (14 of 15). Zooming out, half of the regional surveys (three of six) found at least one species of leaftosser, but only Short-billed Leaftosser (*Sclerurus rufigularis*) was found on more than a single regional survey (three of six), which together suggests that leaftossers are a more uncommon feature of the avifauna here. However, given our snapshot survey during a single dry season, it is impossible to distinguish between true absences and, more likely, non-detections. In nearby Manaus for instance, breeding activity for antthrushes, antpittas, and leaftossers all peak during the wet season (January to June; Stouffer et al. 2013). In fact, one of these leaftossers—the Black-tailed Leaftosser (*Sclerurus caudacutus*)—apparently does not sing during the early dry season there (Stouffer 2007). The absence of song activity, in particular, would obviously drive down detection rates.

Herpsilochmus antwrens

In this region, one of the more interesting ornithological puzzles centers on the genus *Herpsilochmus*, which currently includes 17 mostly black-and-white (and very similar) antwrens found largely in the forest canopies of Amazonia. The local situation in southern Guyana is particularly intriguing, as up to three species may occur in upland rainforest: Spot-tailed Antwren (*H. sticturus*), Todd's Antwren (*H. stictocephalus*), and Spot-backed Antwren

Table 9. The top five bird species detected by terrestrial camera traps during this inventory. Camera trap appearances >30 min apart were tallied as separate detections.

Species	Camp Amuku	Camp Monkey Jump	Camp New River	Total
Gray-winged Trumpeter (*Psophia crepitans*)	68	43	164	275
Black Curassow (*Crax alector*)	14	32	56	102
Variegated Tinamou (*Crypturellus variegatus*)	5	2	0	7
Great Black Hawk (*Buteogallus urubitinga*)	4	0	0	4
Great Tinamou (*Tinamus major*)	2	3	1	6

(*H. dorsimaculatus*). A high priority for the bird team was determining which species are present within the Acarai-Corentyne Corridor, as well as trying to discern potential habitat preferences. To date, only two of these species are known from Guyana, as Spot-backed Antwren is not on the official country list (Braun et al. 2007), even though it is found just across the border in Brazil. In this inventory, we did not detect Spot-backed Antwren either.

In general, where multiple species of *Herpsilochmus* co-occur, they separate by forest type, with typically only one species found in mature upland forest. The other(s) occur in some other distinct habitat type, such as hilltops with poor soil (e.g., Díaz Alván et al. 2021). In this inventory, we routinely found both Todd's (10 days, 11 checklists) and Spot-tailed Antwren (13 days, 23 checklists), but while both species were common at Camp Monkey Jump and Camp New River, we only documented one Todd's Antwren at Camp Amuku (atop Amuku Mountain). Of note, the habitat that Spot-tailed Antwren occupied at Camp Amuku was seasonally flooded forest, both close to the river and farther inland, but not mature upland forest. We also detected Spot-tailed Antwren along the Essequibo River during our downriver commute. At the other two camps, we often found Todd's and Spot-tailed Antwrens in the same canopy mixed-species flock: at least five times at Camp Monkey Jump (along two different trails) and at least four times at Camp New River (along two trails). These syntopic co-occurrences took place in a (dry) swampy streambed, the edge of mature upland forest, and (mostly) well within mature upland forest (see 13 November and 14 November checklists for more details). Thus, although it appears that Spot-tailed might favor floodplain forest and Todd's mature upland forest, both antwrens use mature upland forest, at least within a few kilometers of the larger rivers. More fieldwork is needed to confirm whether these local impressions are broadly representative within these two species' similar and largely overlapping distributions.

Mixed-species flocks

We routinely encountered understory mixed-species flocks led by the Cinereous Antshrike (*Thamnomanes caesius*), which were typical for flocks of the Guiana Shield (e.g., Jullien and Thiollay 1998, Rutt et al. 2020). Interestingly, however, at least three separate flocks momentarily lacked Cinereous Antshrike and were thus presumably led by its congener, the Dusky-throated Antshrike (*T. ardesiacus*): 9 November, 18 November, and 22 November. We also came across at least a few small flocks with White-flanked Antwren (*Myrmotherula axillaris*) but neither of the *Thamnomanes* antshrikes. Across mature upland forest, disturbed forest, and 'transitional' forest, mixed-species flocks were a regular feature of the avian landscape. Cameron quantified the flock encounter rate on eight separate outings (seven distinct trail segments), with an average of one flock every ~610 m (~390 m, ~570 m, ~780 m, 425 m, 500 m, 1420 m, and 720 m). In contrast, in both stunted pole forest and floodplain forest, these flocks appeared to be either absent or reduced (see commentary on 7 November and 8 November, for instance). Aside from the *Herpsilochmus* antwrens (above), the most notable difference from flocks near Manaus, Brazil, were the presence of Speckled Spinetail (in two floodplain forest flocks and one 'transitional' forest flock) and Tepui Vireo at high elevation (~700 m). Compared to flocks around Manaus (Appendix S1 in Rutt and Stouffer [2021]), Rufous-bellied Antwren also seemed to be a conspicuously more regular participant in flocks of the Acarai-Corentyne Corridor.

We found lots of evidence of recent breeding activity among these flocks, which matches the mid- to late dry season peak for flock obligates in the region (August-November; Jullien and Thiollay 1998, Stouffer et al. 2013, Rutt and Stouffer 2021). We confirmed recent reproductive success for at least 10 different flock-following species (highest breeding evidence in parentheses): Yellow-throated Woodpecker (*Piculus flavigula*; Fig. 9P; feeding young), Brown-bellied Stipplethroat (*Epinecrophylla gutturalis*; begging juvenile), White-flanked Antwren (begging juvenile), Long-winged Antwren (*Myrmotherula longipennis*; feeding young), Gray Antwren (*M. menetriesii*; fledged young), Speckled Spinetail (nest building), Black-capped Becard (*Pachyramphus marginatus*; fledged young), Tawny-crowned Greenlet (*Tunchiornis ochraceiceps*; feeding young), Coraya Wren (*Pheugopedius coraya*; begging juvenile), and Yellow-green Grosbeak (*Caryothraustes canadensis*; begging juvenile).

Migrants

For boreal migrants, the timing of our fieldwork (November) coincided with the conclusion of southbound migration. As such, it was difficult to determine whether most of the individuals we encountered were still in active migration or already stationed on their wintering grounds. We detected 10 species of boreal migrants from five families: six species of shorebirds, one hawk, one vireo, one swallow, and one wood-warbler. Only the globally Vulnerable White-rumped Sandpipers (*Calidris fuscicollis*) were passage migrants, far from their final wintering destinations in coastal Patagonia.

Not surprisingly, each of these late long-distance migrants were juveniles or first-year birds. Only small numbers of shorebirds, Osprey (*Pandion haliaetus*), and Barn Swallow (*Hirundo rustica*; through mid-November) were regular along the main rivers. No austral migrants were detected.

Other ornithological insights

Like the *Herpsilochmus* antwrens, another antwren riddle awaits resolution in the canopies of the Guianas. Globally, there are four species of *Euchrepomis* antwrens, a genus of small, warbler-like antbirds with dark caps, wingbars, and colorful rumps. Two of these are largely or entirely restricted to the Andes—including the Rufous-rumped Antwren (*E. callinota*)—whereas the other two range across wide swaths of Amazonia. North of the Amazon River, only the Ash-winged Antwren (*E. spodioptila*) occurs throughout much of the lowlands, but Blake's 1938 expedition documented a new subspecies of the Rufous-rumped Antwren in the Acarai Mountains (*E. c. guianensis*; Blake 1950). Since Blake's expedition, Rufous-rumped Antwren has been found at a small number of scattered, mostly higher-elevation sites in Guyana and Suriname (Robbins et al. 2007, O'Shea 2008, Zyskowski et al. 2011). But whether and how this highly disjunct population(s) of Rufous-rumped Antwren coexists with Ash-winged Antwren is unclear. There are at least four specimens of Rufous-rumped Antwren from the region: two from the Acarai Mountains, Guyana (FMNH 120311 and USNM 625210) and two on or near Tafelberg, Suriname (RMNH 72166 and YPM 139496). Elsewhere in Suriname, there are also a few compelling sight records (e.g., eBird checklists S44098555 and S203785949). In the Acarai Mountains, it appears as if these two *Euchrepomis* antwrens may separate by elevation. For instance, the Robbins et al. (1997) expedition found only Rufous-rumped Antwren above 700 m and Ash-winged Antwren up to 600 m (S92679651). On this inventory, we presumed all singing *Euchrepomis* antwrens were Ash-winged Antwren, but only confirmed this once (12 November), when we used playback to entice a singing bird into the open, at which point we could confirm its pale underparts. We encourage future visitors to the Guianas to consistently interrogate *Euchrepomis* antwrens with playback and confirm whether or not they showcase a yellow belly from below.

eDNA sampling

In nearly 100 water samples, eDNA analyses were able to identify 38 unique avian taxa: 32 species plus three additional genera and three families. Remarkably, two of these species were only detected using eDNA: the Boat-billed Heron (*Cochlearius cochlearius*) and the White-chested Puffbird (*Malacoptila fusca*). The Little Tinamou (*Crypturellus soui*), another potentially new species, was detected at very low read densities, such that it could not be assigned to a specific locality. Given this and the seeming lack of suitable habitat nearby, we currently consider this occurrence to be hypothetical. Although most detected taxa were either aquatic (e.g., a duck, anhinga, herons, an ibis, kingfishers) or large-bodied (e.g., tinamous, a guan, trumpeter, toucans, parrots), eDNA sampling was sensitive enough to detect small songbirds from the understory and canopy (e.g., antbirds, woodcreepers, a euphonia, tanagers). For a more complete discussion of results, please see the *eDNA* chapter on page 151.

Local ecological knowledge

Throughout the entire inventory, the bird team was privileged to trade expertise with Kwang Suse, a ranger for the Protected Areas Commission in KAPA. It was immediately apparent that Kwang had a keen interest in birds (especially the smallest, drabbest ones), a sharp sense of perception, a voracious appetite to learn, and a rapid ability to assimilate new information (e.g., the dynamics of mixed-species flocks). In one particularly memorable episode, Cameron was struck by Kwang's ability to detect a small group of distant Black Curassows that were quietly striding across the forest floor. These same features were also present in other members of our team from Masakeñarî (e.g., Reuben Yamochi). For the Waiwai, birds play a significant role in their traditional cosmology, and featherwork such as headdresses are especially important for ceremonial attire (Howard 1991). During Waiwai Christmas (*xodewika*) celebrations, hunters demonstrate their prowess as archers by shooting carved wooden birds and other animal figures placed on the rafters of the village roundhouse (Mentore 2000). The acquisition and incorporation of sought-after feathers requires not only great skill but also shows their understanding of the birds' ecologies, as even the placement of feathers is stratified according to birds' vertical position in the forest (Roe 1990, Howard 1991).

CONCLUSION

In just 18.5 days of fieldwork (plus opportunistic observations), we documented a diverse community of Guianan birds (339 species in all), with new additions continuing to accrue during our final days in the field: four during our last full day and another new species on the final hour-long outing prior to departure. Given this empirical evidence and the ~100

additional species found on the six other regional surveys, it is clear our sampling of the Acarai-Corentyne Corridor is incomplete. However, the three habitats most in need of (additional) effort were all sampled elsewhere in the region: high elevations in the Amuku and Acarai mountains (here, only a partial day at 700 m; Blake 1950, Robbins et al. 2007), inselbergs (not sampled here; O'Shea and Ramcharan 2012), and lower elevation forests in the northwest corner of the corridor (not sampled here; O'Shea 2018). This means that, collectively, we sampled all major habitats and are therefore not missing any group of birds. Although additional species would continue to accumulate with more intensive effort such as ours (+14 species here), together this indicates that our seven cumulative surveys give a remarkably complete picture of the regional avifauna.

This high and impressive diversity confirms what we would anticipate for an extensive tract of intact, mature upland rainforest, on par with what would be found in well-protected areas of lowland Amazonian rainforest. Further, our rapid inventory revealed a community that appeared to be complete, without any obvious missing elements. Despite sampling at the height of the dry season, when fruiting and flowering trees were scarce, we found representatives from every ecological guild: insectivores, nectarivores, and frugivores from the canopy down to the forest floor. This suggests that all avian components of the ecosystem are present, with the necessary ingredients for complete food cycles and ecosystem services.

For the scientific community, we began to fill in new sections of Guyana's ornithological map with both digital vouchers (archived photos and audio recordings) as well as observational records, helping to round out what is known about Guyana's rainforest avifauna. In the process, we added a new country record for Guyana (Speckled Spinetail), another locality to the small number of widely scattered distributional patches for the Pelzeln's Tody-Tyrant, and photos and audio recordings for a restricted Guianan endemic (Band-tailed Antshrike [*Thamnophilus melanothorax*]; Figs. 9B–C), which had little prior evidence from Guyana. We also provide documentation for two boreal songbird migrants: Black-whiskered Vireo and Northern Waterthrush (*Parkesia noveboracensis*), the latter which reaches its distributional limits here.

In almost every imaginable way, the Acarai-Corentyne Corridor represents an ideal landscape for conservation, with few (if any) direct or immediate threats to birds. This vast tract of continuous forest lacks any signs of modern human disturbance (i.e., no pastures or deforestation) and we did not find a single bird tied exclusively to human settlements. The anthropogenic footprint on this landscape is extremely limited and narrow. The combined population of the three surrounding communities is currently <600 people, and the nature of subsistence hunting in the corridor effectively restricts the impacts to the margins of the rivers themselves. Altogether, the status quo has preserved a healthy, thriving rainforest ecosystem, and we recommend trying to preserve these attributes in order to mitigate potential threats and continue to sustain the livelihoods of the people who depend on this land.

That said, one does not have to venture far in order to see the usual signs of human disturbance that could threaten this isolated ecosystem: the spread of mining or agriculture and the infrastructure that sustains it. Roads lead to other unintended consequences, and the development of regional roads, including those in neighboring countries, has the potential to open Pandora's box, driving deforestation, fragmentation, and logging. In the following space, we suggest a short list of recommendations that would continue to benefit birds within this landscape:

- Reserve hunting and fishing for residents of local communities only.
- Block avenues that would enable people to trap and then trade parrots in coastal markets.
- Sustain livelihoods for local residents and assist efforts that could bolster bird-related ecotourism. For example, the community of Masakeñarî has already constructed a viewing platform to enjoy a large roost of macaws and parrots at sunset and cleared a trail to a lek of the incomparable Guianan Cock-of-the-rock (*Rupicola rupicola*).
- Outfit PAC rangers with the equipment necessary to both document biodiversity and better monitor remote tracts of rainforest.
- Train skilled annotators who could increase the capacity of Merlin Sound ID to automate the identification of a majority of Guyana's avifauna.
- Ensure the continued preservation of this immense tract of intact, continuous rainforest, free of roads and other signs of human infrastructure and disturbance.

MAMMALS

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Conservation targets: The 'Giants of Guyana' (giant armadillo, jaguar, giant anteater, giant river otter, capybara, lowland tapir, white-lipped peccary, red-faced black spider monkey, woolly false vampire bat), comprising the largest members of the major mammal taxonomic groups and those primarily responsible for provisioning key ecosystem services; 10 species considered Endangered, Near Threatened or Vulnerable by the IUCN, 24 species listed in CITES appendices, and 12 species protected by Guyanese legislation; robust populations of game species, especially white-lipped peccary; a complete community of mammals, with representatives of all the trophic guilds

INTRODUCTION

Guyana's mammal diversity has been studied across its territory, especially in sites such as Iwokrama (Lim and Engstrom 2001, 2005), the Rupununi (Pickles et al. 2011, Alonso et al. 2016, Paemelaere et al. 2024), the Kanuku Mountains (Hallett et al. 2019), and some other sections of the Essequibo basin (Alonso et al. 2008, Pierre et al. 2020). However, the southeast of the country still remains mainly unexplored due to its inaccessibility.

During this rapid inventory we aimed to document the mammal community of the Acarai-Corentyne Corridor, a 1.5 million-ha area in the upper Essequibo and New River watersheds. Few studies have taken place inside this corridor and fewer have robustly documented its mammalian populations and diversity (for a history see the *Prior surveys* chapter on page 85). The former Upper Essequibo Conservation Concession, located in the northwestern extreme of the Acarai-Corentyne Corridor, had an inventory of small mammals with some opportunistic records for medium- and large-bodied mammals, for a total of 49 species (Lim 2007).

A biological assessment in the Upper Berbice Region included a sampling site just north of the Acarai-Corentyne Corridor where they recorded 38 species of mammals (Pierre et al. 2020). Previous mammal assessments nearby took place in the headwaters of the Rewa River (Pickles et al. 2011) and in the Kanashen Amerindian Protected Area (Shaffer et al. 2018b). Other rapid assessments have been conducted in nearby areas outside Guyana's borders: at Kwamalasamutu in Suriname (Gajapersad et al. 2011, Lim and Joemratie 2011) and in the northern part of the Grão-Pará Ecological Station in Brazil, neighboring the Acarai-Corentyne Corridor (Secretaria de Estado de Meio Ambiente do Pará 2011a, 2011b, 2011c).

All these studies showed high mammal diversity (~30 species) or highlighted the potential for it. These studies also recorded many species that represent important protein sources for subsistence hunting such as the lowland paca (*Cuniculus paca*; Fig. 10P), red-faced black spider monkey *(Ateles paniscus;* Fig. 10K), bearded saki (*Chiropotes sagulatus*), white-lipped peccary (*Tayassu pecari*; Fig. 10DD), lowland tapir (*Tapirus terrestris*; Fig. 10CC), and brown capuchin (*Sapajus apella*).

These studies painted a picture of what we could expect in the Acarai-Corentyne Corridor and how best to approach data collection within the short period our team was there. We expected to find a complete community of mammals with regularly hunted game species, primates, and seed dispersers (volant and non-volant), as well as medium-sized and large wild cats and other top predators. Moreover, due to its unique location and low human presence, we also expected a robust population of species that are being decimated in other parts of the country due to anthropogenic impacts. Since our target groups were medium- and large-bodied mammals and bats, the likelihood of discovering new species was low, as these groups are well-studied throughout Guyana. Moreover, we anticipated that the elevation differences within the corridor would be too minor to expect medium- and large-bodied mammal species or bats to be restricted to a specific elevation.

METHODS

Prior to field work, we obtained a list of mammal species expected for the Acarai-Corentyne Corridor from Map of Life (see the *Prior surveys* chapter on page 85 for details). We validated this list based on the literature and personal knowledge, removing taxa we consider extremely unlikely to occur in the study area. The taxonomic reference we used for this study was mainly based on species names for Northern Neotropical mammal species (Eisenberg 1989). However, since the taxonomy of many groups has changed recently, we accepted some changes in primates, rodents, ungulates and other groups (Hershkovitz 1985, Mones and Ojasti 1986, Wozencraft 1993, Lima et al. 1998, Wetterer et al. 2000, Voss et al. 2001, Lee et al. 2002, Rowe and Honeycutt 2002, Weksler et al. 2006, Voss and Jansa 2009, Rossi et al. 2010, Lynch-Alfaro et al. 2012, Cortes-Ortiz and Nidiffer 2016, Martins-Junior et al. 2018, Acosta et al. 2020, Barthe et al. 2025).

We surveyed mammals over 14 days (6–21 November 2024) at three sites in the Acarai-Corentyne Corridor. This included five days at Camp Amuku (6–10 November), four days at Camp Monkey Jump (12–15 November), and five days at Camp New River (17–21 November). For detailed information on the

study sites, see Fig. 4 and the *Regional panorama* chapter on page 89.

During the rapid inventory, the mammal team focused on bats, and medium- and large-bodied mammals. We used different methods that complement each other to record different groups of species and obtain different types of evidence, as no single method is effective for detecting all species in every context (Fragoso et al. 2016, 2019).

Medium- and large-bodied mammals

Medium- and large-bodied mammals were recorded by direct observation during trail walks, which yielded arboreal species as well as tracks and signs for terrestrial species, and with camera traps, which were used to capture rare or elusive species (mainly terrestrial) not observed during trail walks. No specimens of medium- and large-bodied mammals were collected.

Trail surveys and opportunistic sightings

At each camp we walked all trails during the day between 06:30 and 17:30, including the periods when we collected the camera traps. We walked 14.4–69.6 km at each camp, for a total of 122 km. In addition to direct observations, we also recorded any other signs of mammal presence (i.e., prints, tracks, vocalizations, burrows, feces, feeding signs, scratches). Unlike other methods, this one allows us to make a record of arboreal species, especially primates. We complemented our observations with sightings made by other members of the biological team and by the advance team during the camp construction period. To estimate sampling success for this method, we divided the number of records made by the mammal team by the distance we walked. For a map of the trails at each campsite see the *Regional panorama* chapter on page 89.

Camera trapping

Camera trap photos and videos were obtained following well-established methods for camera trap research (Rovero et al. 2017). With the support of local experts, 42–45 camera traps (Bushnell Core Prime #119932CB, Bushnell©, KS, USA and Reconyx HF2X HyperFire 2, Reconyx©, WI, USA) were set at each camp during the advance work and collected at the end of the field work. Cameras were left in the field for 6–36 trap-nights (mean = 19) between 17 October and 21 November 2024. The sampling effort totaled 2537 trap-nights in 131 locations across the three camps. Information on the locations of each camera trap is accessible at https://doi.org/10.5061/dryad.m0cfxppg5.

Cameras were placed along the trail system, ~500 m apart, with a single camera at each trap location, set 30–60 cm from the ground in proximity to observed animal signs (tracks, paths, marks on trees, scat, animal trails), no farther than 30 m from the trails. Additional cameras were set opportunistically farther away, outside of the trail system (primarily Reconyx cameras set to take videos) in areas where signs of habitat or resource specialists were detected. Cameras were active 24 hours per day, with a 1- to 3-second delay between each 3- or 5-image photo sequence, or a 10-second video without a quiet period between triggers. In an effort to reduce wariness around cameras and avoid biased capture rates, no scents or lures were used, and all cameras employed were equipped with infrared flash.

All camera traps recorded the date and time with each photo or video. For each, we recorded coordinates in decimal degrees (Datum: WGS 84), camera information, installation date and time, and physical description of the station. Camera trap data was uploaded in the project 'RI-32 Guyana: Acarai-Corentyne Corridor' in Wildlife Insights (Ahumada et al. 2020).

Bat records

In order to optimize bat records, we used mist-nets and ultrasonic audio recorders, which allowed us to record phyllostomid bats and aerial insectivores, respectively (Yoh et al. 2020).

Mist-net sampling

Mist-net surveys are generally considered more effective for phyllostomid species that feed on the understory, closer to the forest floor. At each camp we installed 10 understory mist-nets (12 x 2.5 m) in pairs or triplets that remained active from dusk until 22:00, for an average sampling time of four hours per night. At each camp, we captured bats for at least two nights, weather permitting (no mist-netting was done in poor conditions). We totaled a sampling effort of 60 mist-net-nights, where one mist-net-night is equivalent to one mist-net of 12 m active for four hours per night (Table 10). Information on the locations of each mist net is accessible at https://doi.org/10.5061/dryad.m0cfxppg5.

Nets were checked every 30 minutes. Captured individuals were placed in cloth bags until processing time. For each individual, we recorded weight, age, sex, and forearm length. We used experience and field identification keys to determine the species of the captured individuals (Lopez-Baucells et al. 2016).

Following identification, we took hair samples from the dorsal region of all captured bats, using steel scissors that were

Table 10. Sampling effort, number of mammal records and their relative abundance as a function of sampling effort, and diversity index (for camera traps data only) during a rapid inventory of the Acarai-Corentyne Corridor in October and November 2024.

Sampling method			Camp			Total
			Camp Amuku	Camp Monkey Jump	Camp New River	
Camera trapping	Independent records		296	247	501	**1044**
	Effort	Trap-nights	741	518	1278	**2537**
	Relative abundance Index	Independent records per 100 trap-night	11	10	20	**41**
	Diversity Index	Richness	19	19	20	**22**
		Shannon's Index (H)	2.53	2.31	2.47	**2.54**
		Simpson's Index (D)	0.09	0.13	0.11	**0.1**
Trail surveys for direct sightings and signs	Records		59	24	12	**95**
	Effort	Effort (km walked)	69.6	38	14.4	**122**
	Relative abundance	Records per 100 km	85	63	83	**79**
Bat captures	Captures		15	0	5	**20**
	Effort	Mist-net-nights	20	20	20	**60**
	Relative abundance	Captures per 100 mist-net-nights	75	0	25	**33.3**
Bat acoustic recordings	Effort	Active hours	86.6	144.7	64.5	**295.8**

disinfected with alcohol between every collection. This allowed recaptures to be recognized (Harvey and Gonzalez Villalobos 2007, Helbig-Bonitz et al. 2015). Hair samples were stored in 1.5-ml Eppendorf plastic vials or coin envelopes to prevent mold. These samples will be used in the future to measure potential mercury levels in individuals through specialized analyses in laboratories. For all captured individuals, we took a sample of the wing patagium using disposable biopsy punches of 2 mm that we kept in cryovials with DNA/RNA Shield reagent.

At each camp, we collected individuals of each species as museum specimens. We used standard euthanasia methods (AVMA 2020), by an overdose of inhaled anesthetics (isoflurane), and in some cases we administered an additional lethal dose of pentobarbital intraperitoneally. Once the specimen was confirmed to be euthanized via cessation of breathing (confirmed by sight) and stoppage of the heart (confirmed by touch), we opened a cavity in the ventral area of the body and removed samples of tissue for the liver and colon (5–7 mm). We kept the tissue in 2-ml cryovials with ~600 uL of DNA/RNA Shield reagent. Lastly, to preserve the specimens we injected 10% formalin into the chest and head muscle as well as the viscera and stored them in a container with 10% formalin. Immediately following field work, all collected samples were transported to the Centre for Study of Biological Diversity (CSBD) for processing and verification for exportation to the Field Museum in Chicago. Collections were

done under permit provided by the Guyana government (EPA Permit to conduct Biodiversity Research # 20240918 BR 010, GWCMC research export permit FI/LD/25/2024) and Field Museum IACUC Study #2024-2.

Bat acoustic recordings

At all campsites and during the camp installation period, we placed ultrasonic recorders (Audiomoth, Hill et al. 2019; Anabat Titley) along the trails, near streams and tree gaps. We installed three Audiomoth recorders per camp, in forest clearings along trails, and configured them to obtain a 1-minute recording every 5 minutes every night (17:30 to 06:00) with a sampling rate set at 384 kHz. They were installed during the advance period and collected at the end of the inventory field work in each camp. In addition, we placed an Anabat recorder opportunistically in the surroundings of camps, creeks, and the Essequibo River at Camp Amuku and Camp Monkey Jump, based on sightings of bats or high likelihood of recording species associated with water. The Anabat was set to be active from 17:30 to 06:00 at Camp Amuku and Camp Monkey Jump during the advance and inventory period. We configured it with a division ratio of eight, a high sensitivity, and continuous recording mode. All recorders were set in Guyana Time (GMT-4) with an output format in .wav for Audiomoths and zero crossing (.zc) for Anabat. Information on the locations of each recorder is accessible at https://doi.org/10.5061/dryad.m0cfxppg5.

Environmental DNA

In addition to the methods described above, a separate team recorded a number of mammal species using environmental DNA (eDNA) metabarcoding of 97 water samples collected during the inventory and processed afterwards. For a detailed description of eDNA methods, please see the *eDNA* chapter on page 151. Below we present results from both the field surveys and the eDNA analyses.

Data analysis

We estimated the relative abundance for the species most frequently detected by camera traps and trail surveys, as a function of sample effort. In the case of camera trapping, we estimated the Relative Abundance Index of each species as the number of independent records per 100 camera trap-nights. Images of the same species that occurred at the same trap site within a period of 30 minutes were excluded from this analysis to ensure that photo occurrences were independent (Tanwar et al. 2021). Diversity indices (richness, diversity expressed by Shannon's Index, and dominance expressed by the Simpson's Index) as well as naive occupancy (expressed by the proportion of sites occupied to measure how widespread a species is) were applied to a cohort of mammals that included only those species that are effectively sampled by camera traps (fully terrestrial medium- or large-bodied mammals). For the trail survey data, we estimated relative abundance for species with more than five records per camp, as the number of signs or sightings per 100 km traveled. For bat captures we estimated relative abundance as capture rate (number of individuals caught per 100 mist-net-nights).

To analyze the acoustic recordings we used Analook W software (version 4.6e, http://www.hoarybat.com/Beta) and Kaleidoscope 4.0.4 software (Wildlife Acoustics Inc., Massachusetts, USA). We used subjective and qualitative methods for species determination (O'Farrell et al. 1999), comparing recorded files with verified voucher files of known species maintained by Dr. Bruce Miller and published call parameters (e.g., López Baucells et al. 2016, Thiagavel et al. 2017). We assigned sono-species that have yet to be verified acoustically. Names were assigned on the basis of the family or genus identified and the characteristic frequencies (Fc) of the dominant harmonic. For example *Eumops* 18–25kHz is a species in the genus *Eumops* with a Fc between 18 and 25 kHz. For analysis purposes, we discarded fragmented calls, isolated feeding buzzes, and social calls from the sono-species records.

To identify species of conservation interest we cross-checked our list of recorded species with the IUCN Red List (IUCN 2024), UNEP (2024), and Guyanese legislation.

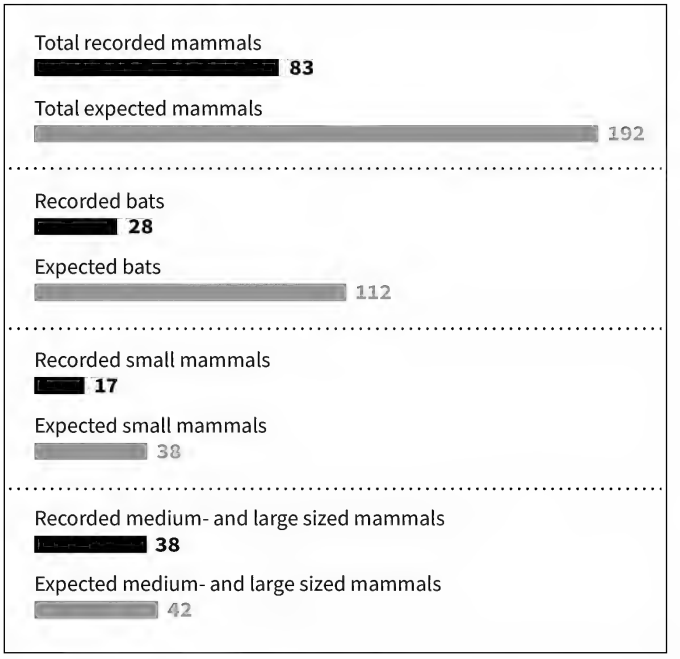
RESULTS

Expected vs. recorded species

At the time of writing (April 2025) the five sampling methods had yielded 83 mammal species: 38 medium- and large-bodied mammals, 28 bats, and 17 small mammals. Recorded species belong to nine orders, 28 families, and 70 genera. When compared to the expected 192 species projected to occur in the area (Fig. 36), our dataset represents 93% of the medium- and large-bodied mammals, 25% of the bats, and 45% of the small mammals expected for the area. As analysis of the ultrasonic recordings is still in progress, the number of bat species recorded during field work is likely to increase.

The most diverse orders were Rodentia (7 families), Chiroptera (6), and Primates (3; Table 11; Appendix 7). We recorded 12 carnivores: three species of small cats (*Herpailurus*

Figure 36. Breakdown of expected vs. recorded number of mammal species for the Acarai-Corentyne Corridor. The number of recorded bat species is expected to increase as audio recordings are processed and verified.



yagouaroundi, *Leopardus pardalis* [Fig.10Z] and *L. wiedii*), two species of big cats (*Panthera onca* [Fig.10Y], *Puma concolor*), one canid (*Speothos venaticus*), three mustelids (*Lontra longicaudis*, *Pteronura brasiliensis* [Fig.10AA], *Eira barbara* [Fig.10H]), and three procyonids (*Nasua nasua* [Fig.10BB], *Potos flavus, Procyon cancrivorus*). All primates and ungulates expected for the area were recorded during field work, as well as one Perissodactyla (*Tapirus terrestris*; Fig. CC) and four Artiodactyla (*Dicotyles tajacu* [Fig.10E], *Tayassu pecari* [Fig.10DD], *Mazama americana* [Fig.10EE], *Mazama nemorivaga*; Appendix 7). A detailed breakdown of records per camp according to order and number of species is provided in Table 10.

Outcome of different sampling methods

Camera traps

We obtained 1044 independent camera trap records of mammals that were identified to the species level (Table 10). These yielded 30 species of medium- and large-bodied mammals (22 fully terrestrial) as well as small mammals (marsupials and unknown rodents) and bats. This method allowed us to detect five species that were not recorded at the species level with other methods (*Cabassous unicinctus*, *Dasypus guianensis* [Fig.10F], *D. kappleri, Herpailurus yagouaroundi*, *Procyon cancrivorus*). The three camps showed similar species richness, diversity (H), and dominance (D) of medium- and large-bodied mammals (Table 10, Fig. 37).

Trail surveys and opportunistic sightings

Trail surveys yielded 95 records (Table 10) of 18 medium- and large-bodied mammal species through direct observation, vocalizations, tracks and signs by the members of the mammals team members (Appendix 7). To estimate sampling success of trail surveys we divided the records made by the mammal team by the distance we walked, obtaining 79 records per 100 km (Fig. 38). Conditions were very dry at all three camps, limiting visibility of tracks left by small-bodied species. The most common species documented on transects were those with the largest and most conspicuous tracks (peccaries, tapir, deers) or signs (armadillos and giant

Figure 37. Relative abundance index (number of independent records per 100 trap-nights) of mammal species caught on camera traps during a rapid inventory of the Acarai-Corentyne Corridor.

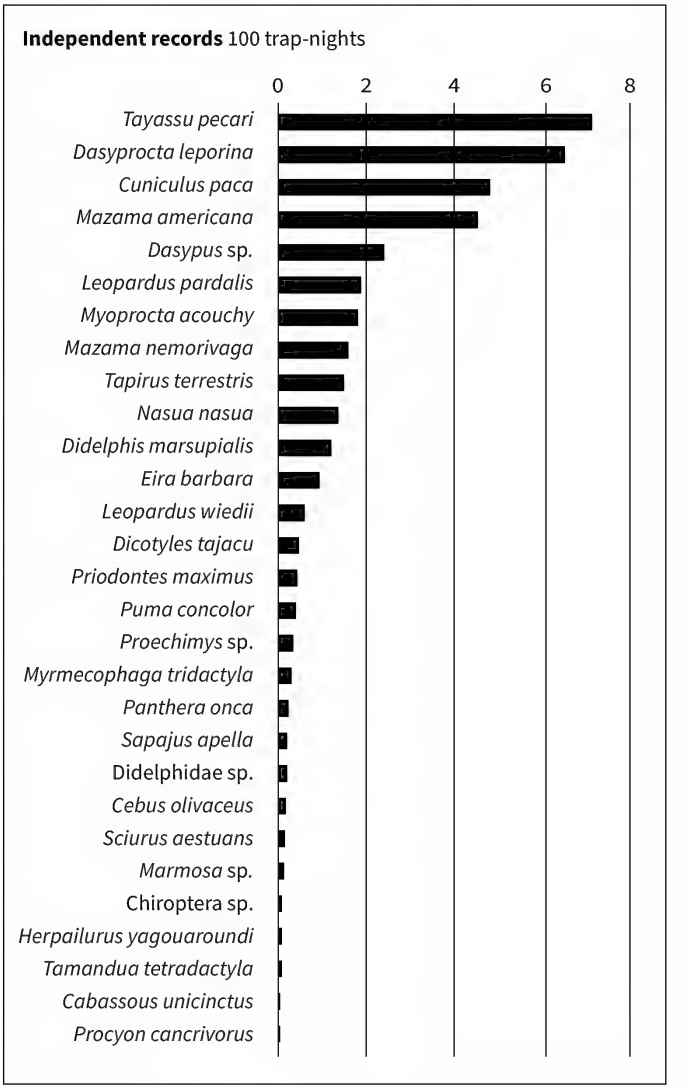
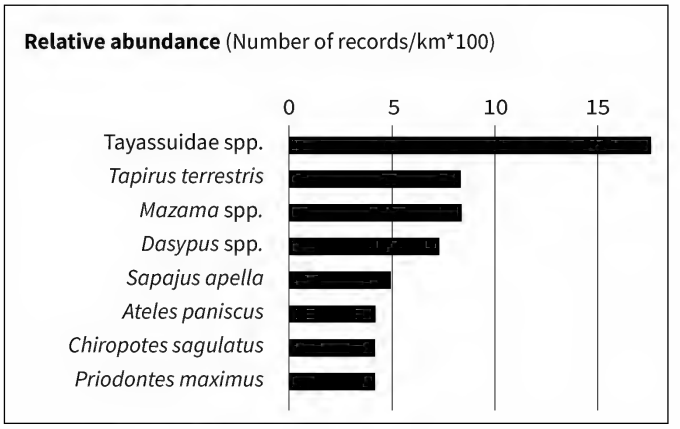


Figure 38. Relative abundance (Number of records/km*100) of mammal species with more than five records across three camps through trail surveys during a rapid inventory of the Acarai-Corentyne Corridor. Tayassuidae spp. corresponds to *Tayassu pecari* and *Dicotyles tajacu*, *Mazama* spp. to *M. americana* and *M. nemorivaga*, and *Dasypus* spp. to *D. guianensis* and *D. kappleri*.



armadillo) and those that typically feed near creeks where wet soil maintains the ability to hold tracks for an extended period of time (white-lipped peccary, tapir). Primate species were also among the most recorded species during the trail surveys, either in groups or as solitary individuals. This was the case for the red-faced black spider monkey (Fig. 10K), brown capuchin and the reddish-brown bearded saki (Fig. 38).

Additionally, the >300 opportunistic sightings by the mammals team members when installing camera traps and commuting between camps, as well as by other team members, added eight species that were not recorded by camera traps or other methods (Fig. 39), including three species of opossum, one fruit bat, and one small rodent.

Mist-nets

We captured 20 individuals of five bat species across the three camps (Table 10). Nine of the captured individuals were euthanized and collected, representing the families Mormoopidae (1 individual) and Phyllostomidae (8). None of these species were recorded with audio recordings (Fig. 40).

ACOUSTIC MONITORING

We obtained 295.8 hours of bat audio recordings, with a total of 5582 files from the Audiomoth recorders and 14,805 files from the Anabat recorders. Of the 2431 files we had reviewed through 1 December 2024, 525 (21.6%) presented at least one bat species. We identified 15 taxa, seven of which were determined to species, and eight as sono-species. The species and sono-species belonged to four families: Emballonuridae, Noctilionidae, Molossidae, and Vespertilionidae. Some sono-species may represent more than one species. Except for *Cormura brevirostris*, *Rhynchonycteris naso* (Fig. 10S), and *Noctilio leporinus*, most bat species were recorded only by one method (Fig. 40). When combined, the two methods for bat sampling plus the eDNA method and opportunistic sightings, yielded 28 bat species (thus far) from the families Emballonuridae, Phyllostomidae, Mormoopidae, Molossidae, Noctilionidae, and Vespertilionidae.

Figure 39. Complementarity among methods used to record different groups of mammals (except bats). The sum of all species recorded by a method or a combination of methods is highlighted in black. Number of species recorded by eDNA and a given method are highlighted in white.

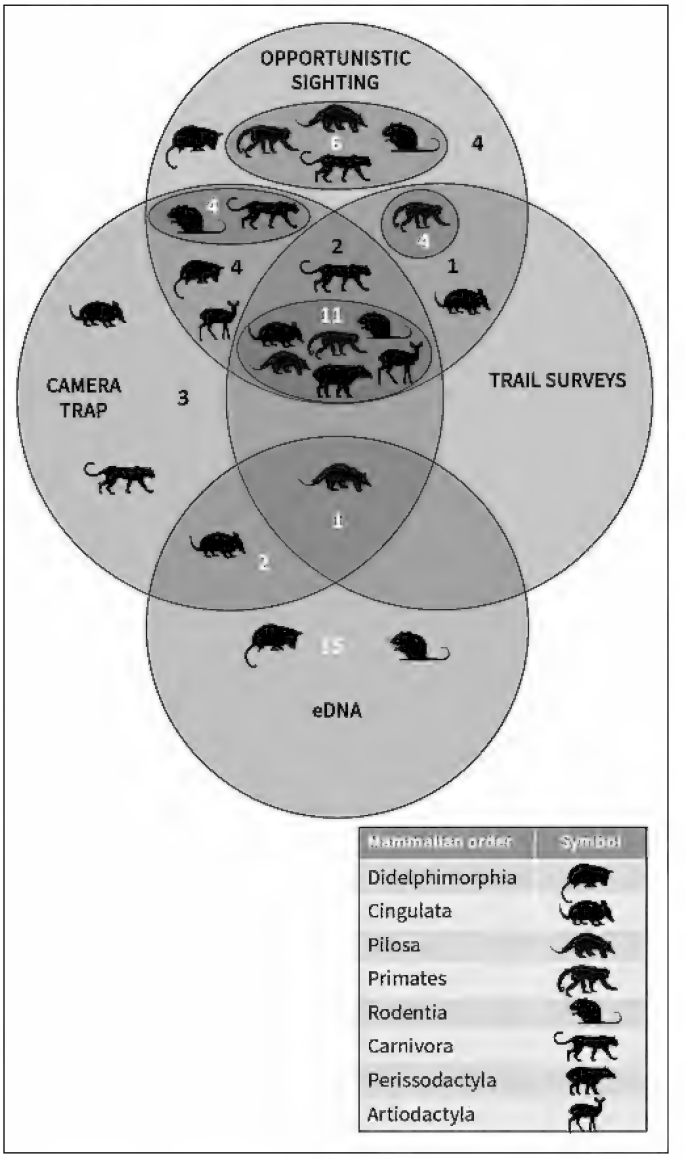
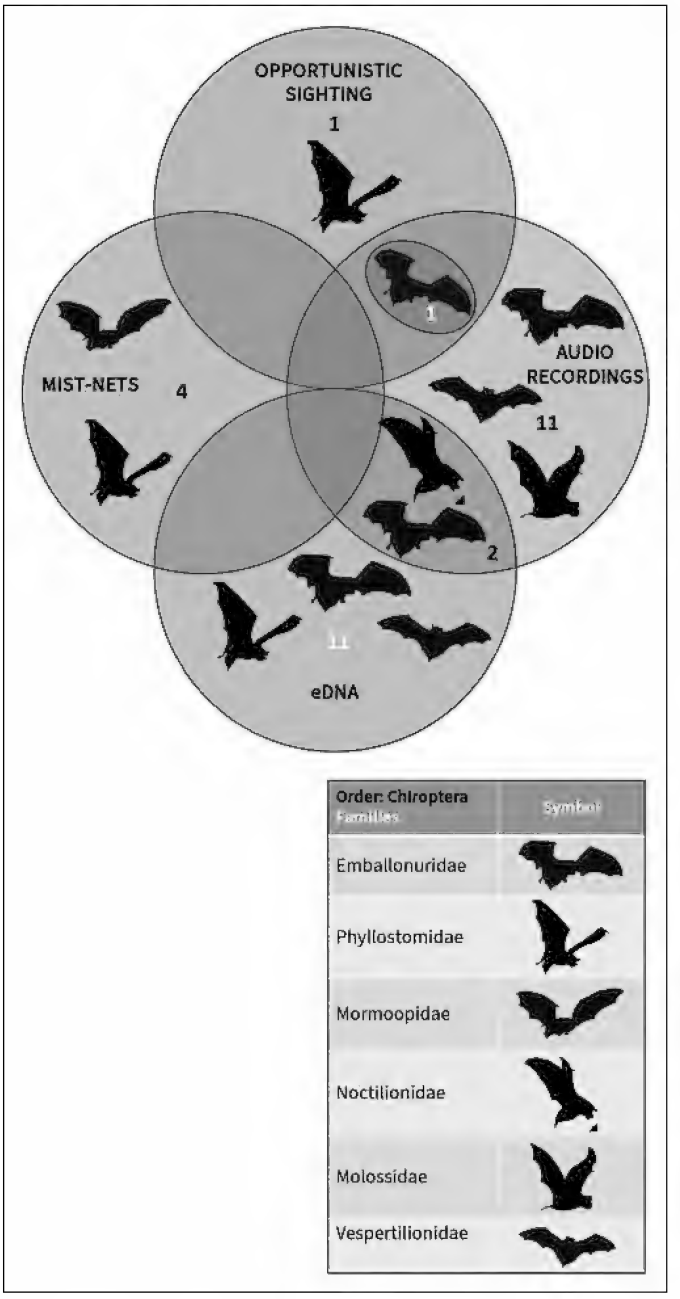


Figure 40. Complementarity among methods used to record different families of bats. Numbers represent the sum of all species recorded per method or combination of methods. Numbers of species recorded by eDNA and a given method are highlighted in white.



Environmental DNA

Environmental DNA water samples recorded a total of 55 mammal species and 15 additional mammal taxa that were identified at lower taxonomic ranks. This includes 15 species not documented by other methods: 10 bat species, six opossum species from the family Didelphidae, six rodent species from the family Cricetidae, and two from the family Echimyidae (Fig.39). Environmental DNA also detected a species (*Marmosa demerarae*) that could correspond to one we identified to the genus level (*Marmosa* sp.) in camera trap photos.

Campsite contributions

Camp Amuku

We recorded 57 species (9 orders) of mammals at this site (Table 11, Appendix 7). One notable species captured at Camp Amuku was the crab-eating raccoon (*Procyon cancrivorus*). A species of slender opossum (*Marmosops* sp.; Fig. 10C) was only recorded in this camp through an opportunistic encounter. Leucistic tayras (*Eira barbara*) were captured in six of the 17 camera trap pictures of the species at this camp, as well as an opportunistic sighting (Fig. 10H). We recorded three species of bats with mist-nets. These were mainly insectivores: Parnell's mustached bat (*Pteronotus parnelli*; Fig. 10V), the white-throated round-eared bat (*Lophostoma silvicola*; Fig. 10R), and the omnivorous lesser spear-nosed bat (*Phyllostomus elongatus*). Additional records from the bat recorders and eDNA yielded 18 taxa; five of the species recorded acoustically were identified to the species level. One opossum, four rodent species, and a carnivore were only recorded by eDNA.

Camp Monkey Jump

We recorded 54 species in nine orders at this site (Table 11, Appendix 7). While we did not capture bats at this camp, we opportunistically recorded a phyllostomid species from the subfamily Stenodermatinae, likely *Mesophylla macconnelli* or a species of the genus *Dermanura*. Bat recorders yielded 14 taxa, and two of the species recorded acoustically were identified to species level. The pale-throated sloth (*Bradypus tridactylus*) was recorded in this camp through eDNA and opportunistic encounters only. Two opossums, five small rodents, the Southern tamandua (*Tamandua tetradactyla*), and two carnivores were only recorded by eDNA.

Camp New River

We recorded 50 species in nine orders at this site (Table 11, Appendix 7). Brazil nut trees here were fed on by red-rumped agoutis (*Dasyprocta leporina*) and white-lipped peccaries (*Tayassu pecari*; Fig. 10DD). New records for our list from Camp New River included the Southern naked-tailed armadillo (*Cabassous unicinctus*), the Brazilian porcupine (*Coendu prehensilis*), recorded in an opportunistic encounter, the bush dog (*Speothos venaticus*), recorded through an opportunistic encounter with its tracks, and the woolly false vampire bat (*Chrotopterus auritus*; Fig. 10W), a carnivorous

bat. As at Camp Amuku, in addition to the common fur color pattern (dark brown with paler head and neck), we recorded one leucistic tayra (*Eira barbara*) in the camera trap pictures (Fig. 10H). The bat recorders and eDNA records allowed us to add eight taxa. Notable observations from Camp New River included an active giant river otter (*Pteronura brasiliensis*) dam close to camp. At least three individuals were spotted along the river or at the den site during the team's transect walk. One opossum, four rodent species and the kinkajou (*Potos flavus*) were recorded only by eDNA at this camp.

Mammals and the Acarai-Corentyne Corridor

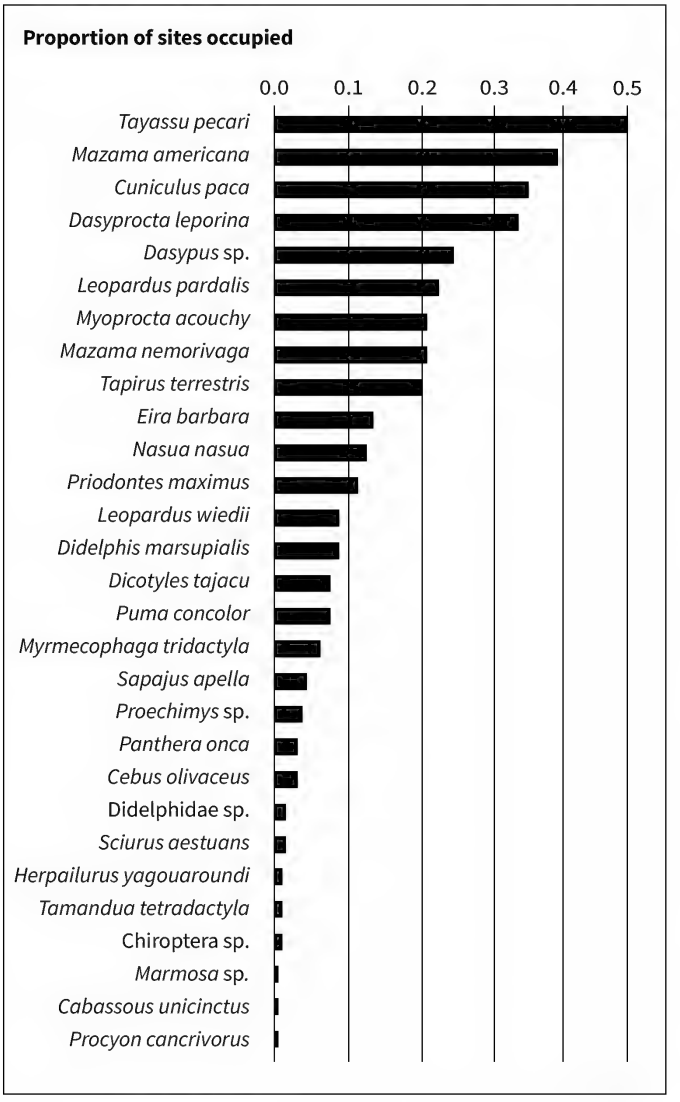
Diversity indices indicate that the community of terrestrial mammals in the Acarai-Corentyne Corridor is diverse but fairly uneven, dominated by the five most common (measured by Relative Abundance Index) and widespread (measured by naive occupancy, Fig. 41) species: white-lipped peccary (*Tayassu pecari*; Fig. 10DD), red-rumped agouti (*Dasyprocta leporina*), red brocket deer (*Mazama americana*; Fig. 10EE), lowland paca (*Cuniculus paca*; Fig. 10P), and long-nosed armadillo (*Dasypus* sp.). The next most common and widespread cohort of species includes large herbivores (tapir [*Tapirus terrestris*; Fig. 10CC]), large insectivores (giant armadillo [*Priodontes maximus*; Fig. 10Q]), and medium-sized carnivores (ocelot [*Leopardus pardalis*]), followed by a suite of large carnivores (jaguar [*Panthera onca*; Fig. 10X], puma [*Puma concolor*]), and a suite of semi-arboreal species (margay [*Leopardus wiedii*; Fig. 10X], opossums (*Didelphis marsupialis*; Fig. 10D), tayra (*Eira barbara*; Fig. 10H), and coati (*Nasua nasua*; Fig. 10BB).

Frequent sightings and records of most medium-large mammals in all three camps suggest a rich diversity of mammals within the corridor. Large cats recorded by camera traps and direct sightings further indicate that mammals within the corridor were not startled by human presence nor avoided us. The dry season did not impact sightings and camera recordings of medium- and large-bodied herbivores, frugivores and rodents as some individuals were captured feeding on young shoots and leaves. We also noted evidence of fruit feeding and feeding interactions re-affirming the high presence of species from the orders Artiodactyla and Rodentia. Overall, we noted a good distribution of prey species as well as records of both large cats and several other carnivore species, highlighting the ecological completeness of the landscape. Further, we observed signs of healthy populations by detecting the presence of adults accompanied by young individuals across different groups of mammals including anteaters, primates, rodents, carnivores and ungulates (*Myrmecophaga*

Table 11. Diversity of mammal orders recorded at the three camps during a rapid inventory of the Acarai-Corentyne Corridor in October and November 2024. Numbers are expected to increase as the team continues to process and verify data.

Order	Number of families recorded	Number of species recorded	Number of species recorded per campsite		
			Camp Amuku	Camp Monkey Jump	Camp New River
Didelphimorphia (Opossums)	1	8	3	4	3
Cingulata (Armadillos)	2	4	3	3	4
Pilosa (Anteaters and Sloths)	2	3	2	3	2
Primates	3	8	8	8	7
Rodentia (Rodents)	7	15	9	9	11
Chiroptera (Bats)	6	28	18	14	10
Carnivora	4	12	9	10	8
Perissodactyla (Odd-toed Ungulates)	1	1	1	1	1
Artiodactyla (Even-toed Ungulates)	2	4	4	4	4
TOTAL	**28**	**83**	**57**	**54**	**50**

Figure 41. Naive occupancy (proportion of sites occupied) of mammal species caught on camera traps during a rapid inventory of the Acarai-Corentyne Corridor.



tridactyla, Sapajus apella, Saimiri sciureus, Ateles paniscus, Dasyprocta leporina, Cuniculus paca, Puma concolor, Nasua nasua, Tapirus terrestris, Tayassu pecari, Mazama americana). We infer ecosystem service synergies across the corridor that are influenced by the variety of landscapes, floral diversity, and predator prevalence, reflecting a healthy ecosystem with minimal to no anthropogenic impacts.

All eight species of primate known to occur in Guyana were observed either during transect surveys, through opportunistic observations, camera traps, or a combination of them, with the reddish-brown bearded saki being the most commonly observed, followed by the red-faced black spider monkey (Fig. 10K), wedge-capped capuchin, howler monkey, squirrel monkey, brown capuchin, golden-handed tamarin, and white-faced saki. Monkeys, in general, seemed to be relatively abundant at all three sites. The wedge-capped and brown capuchin were the species most commonly documented by camera traps and were observed directly foraging on the ground, primarily for Brazil nuts.

Capybaras (*Hydrochoerus hydrochaeris*) were also observed on a couple of occasions and are considered relatively common across the survey area. They are highly aquatic, frequently spending the day completely or mostly submerged in dense vegetation along riverbanks, only emerging to feed at night on grasses along water edges.

The pale-throated three-toed sloth (*Bradypus tridactylus*), Brazilian porcupine (*Coendou prehensilis*), kinkajou (*Potos flavus*), Guianan squirrel (*Sciurus aestuans*), woolly mouse opossum (*Marmosa* sp.), and delicate slender mouse opossum (*Marmosops* sp.; Fig. 10C) are all arboreal species that were also observed opportunistically by the research team along the trails. These species are not uncommon but each is rarely sighted due to their inconspicuous nature and tendency to remain in the upper canopy.

Giant river otters (*Pteronura brasiliensis*) were observed during transect surveys along trails that passed close to river edges, with their presence initially indicated by their loud vocalizations and territorial nature. However, giant river otters were also observed opportunistically at all three camps, as well as in transit between camps, providing further evidence of the intact nature of the Acarai-Corentyne Corridor. The Neotropical otter (*Lontra longicaudis*) was recorded by eDNA, and only observed on two occasions in the Essequibo River during transit between camps.

Local knowledge

Waiwai participants in the inventory shared relevant information about the importance of mammal species for their daily lives and identity. In Waiwai culture, hunting skill is an especially significant source of esteem or prestige for men's contribution to subsistence activities (Mentore 2000, 72). Masakeñarî experts described intergenerational knowledge sharing about hunting, such as elders encouraging new hunters with information about where to aim for an effective kill. They also effectively make whistles and calls to attract animals like primates, tapirs, and deer, which were used during the rapid inventory as well as reported to be common on other hunting trips. Hunting is also part of cultural ideas about the relationship between human beings and animals, including Waiwai ideas about reciprocity in which Waiwai people benefit as receivers of meat from the generosity of animal beings

Table 12. Comparison of camera trap sampling effort between previous studies in protected or well-studied areas across Guyana and the present study.

Study area	Trap locations	Trap nights	Mammal species
Rupununi savannas	199	17,459	47
Kanuku Mountains Protected Area	221	8840	46
Karawaimin Taawa	43	2775	37
Manaka/Winiperu	49	5130	32
This study	**131**	**2537**	**29**
Barima Mora Passage	30	3018	28
Iwokrama International Centre	43	1720	27
Upper Berbice	67	2821	20
Kaieteur	40	1204	18

(Mentore 2005). For example, Masakeñarî experts described how sometimes animals stop responding to their whistles and calls, and hunters return home without meat. Waiwai participants in the inventory also reported making decisions about hunting mammals only at certain times of year, such as primates primarily in May, and selective harvesting, such as choosing not to shoot mammals seen as too thin. Meat is also shared out intentionally by hunters, with tapir meat distributed to the entire community, suggesting cultural norms about subsistence hunting that ensure game animals are not wasted. Game meat from white-lipped peccaries and tapirs are popular amongst community members, especially during their Christmas festival. No illegal hunting by coastal Guyanese or other people has been detected in the territory, and meat is not sold within the community. Regarding the abundance of white-lipped peccaries, Masakeñarî experts confirmed they can be observed during both rainy and dry seasons, and are seen with juveniles throughout the year. Their perception is that the white-lipped peccary population seems stable (i.e. not decreasing with hunting practices), though Waiwai people also observed problems with white-lipped peccaries damaging community farms over approximately the last five years, which to them indicated a greater population in comparison to previous years.

DISCUSSION

We observed several signs indicating that the Acarai-Corentyne Corridor supports healthy ecosystems capable of sustaining complete mammal communities. Additionally, the area appears to be infrequently visited or used by people, and hunting appears to be rare. Direct observations were fairly common along the trails and the fact that wildlife, especially large terrestrial mammals and primates, typically appeared calm and did not immediately flee indicates an overall lack of anthropogenic pressure. In particular, the red-faced black spider monkey (Fig. 10K) seemed curious with males being aggressive towards our presence—behavior that would not be expected if they were the subject of hunting pressure, especially as Waiwai prey (Shaffer et al. 2018b). Giant river otters, considered Endangered by the IUCN, are a prime indicator of aquatic ecosystem health as they are known to consume fish from large orders such as Characiformes and Perciformes (Rosas et al. 1999, Rosas-Ribeiro et al. 2012). The fact that they were observed regularly at each site was one of the more remarkable findings of our surveys.

The location of our camps, covering a variety of habitats, a combination of sampling methods to accommodate a vast diversity of mammal species (arboreal, aquatic, volant, and small-bodied species) that are not effectively surveyed by only one method, and the contribution of all inventory participants providing opportunistic sightings allowed us to obtain a representative sample of the mammal community of the Acarai-Corentyne Corridor. When compared to protected areas that are considered as reference biodiversity hotspots in the Amazon, such as Cocha Cashu in Manu National Park in Peru (Ascorra et al. 1991, Pacheco et al. 1993; Zavala, personal communication), we find major differences in species richness in groups such as Primates (13 versus 8), and Chiroptera (40 versus 28). When compared to areas in and around the corridor, our results resemble or surpass previous mammal

records in several groups. We recorded similar medium- and large-bodied communities as the ones reported by Lim (2007), Sanderson et al. (2008), Secretaria de Estado de Meio Ambiente do Pará (2011c), Shaffer et al. (2018b), Pierre et al. (2020), and Lim and Joemratie (2011). We did not detect 11 species of bats recorded in the former Upper Essequibo Conservation Concession (Lim 2007), or nine additional bat species recorded during the assessment of the Upper Berbice Region (Pierre et al. 2020).

During our study we did not record any small primate species that could correspond to the potentially new species of *Callibella* reported in the Grão-Pará Ecological Station in Brazil (Secretaria de Estado de Meio Ambiente do Pará 2011b). Local experts reported no species of monkey of that size and type in the surroundings of Masakeñarî village or the surrounding forest.

The few bat species we captured have been mostly reported in the bat assessments done nearby. For example, the Kwamalasamutu Rapid Assessment in Suriname documented 26 bat species (Lim and Joemratie 2011), including three of the four we recorded through mist-netting. The only exception was *Chrotopterus auritus*, which was not detected in their assessment. Additionally, because acoustic monitoring was not part of their methodology, they recorded only two species of aerial insectivores, both captured with mist nets. Their assessment also included the capture of 12 non-volant small mammals using live traps, a method that was not employed in our study. They recorded 29 species of medium- and large-bodied mammals using camera traps, searching for scat and animal tracks and making visual and aural observations (Gajapersad et al. 2011). We more than doubled that record during this study. All species, except *Neacomys* sp., were recorded during our inventory, in some cases by species synonyms.

Although some species were only recorded in one camp during the inventory, this does not indicate that those species are not present in other areas of the Acarai-Corentyne Corridor. A longer period of time for the inventory would most likely have allowed them to be recorded. Some species are likely present in the Acarai-Corentyne Corridor but were not spotted during our surveys (silky anteater [*Cyclopes didactylus*], Linnaeus's two-toed sloth [*Choloepus didactylus*], and Northern tiger cat [*Leopardus tigrinus*]).

This rapid inventory had a higher camera trap effort than previous ones conducted by the Field Museum and partners. When compared to efforts in protected or well-studied areas across Guyana, this study ranks mid-level in terms of species richness relative to effort expended (Table 12). Camera traps allowed us to document at least 29 species of fully terrestrial medium- and large-bodied mammals, as well as intermittent records of semi-arboreal, semi-aquatic, and small-bodied species. Sampling-related variables may have driven important variations in occupancy of the mammal community. The goal of this survey was to document as many species as possible, meaning that sampling was not targeted at any particular genus of mammals, thus introducing advantages and disadvantages at each site. Additionally, the design of this study (500 m spacing) was best suited for documenting species with smaller home ranges (agouti, paca, acouchy, deer) at higher densities compared to wide-ranging species like jaguar, pumas, etc. Finding five dominant species (white-lipped peccary, red-rumped agouti, red brocket deer, lowland paca, and long-nosed armadillo) is not uncommon for Neotropical mammals, as most species of large tropical forest mammals exist naturally at relatively low densities (Arita et al. 1990). The majority of plant biomass in tropical forests is either out of reach in the upper canopy or indigestible for these large terrestrial frugivores and herbivores (Peres and Palacios 2007, Fa and Brown 2009). The species that are released from these biological limitations are typically either omnivorous (white-lipped peccaries), insectivorous (long-nosed armadillos), or readily take advantage of locally abundant resources in a particular environment (agoutis, red brocket deer, paca). The distribution of species found in the study sites is natural and primarily dictated by biological conditions. This contrasts with many other studies of Neotropical mammal communities where the impacts of hunting, logging, mining, and other anthropogenic activities are the primary drivers of mammal distribution and abundance.

During the inventory, we only managed to capture 20 bats across the three camps, from just five species. Four species captured were phyllostomids and one was a mormoopid. These numbers were much lower than expected and lower than comparable sites from Guyana. We believe this result reflects the combination of extremely dry weather conditions and the full moon period that overlapped the inventory surveys. Moonshine intensity illuminates forest understories, increasing predation risk for small mammals, including bats (Prugh and Golden 2014). The lack of fruiting or flowering trees in the sampling locations as a result of the dry season (July-November) may have contributed to the lack of frugivores and nectarivores. Amongst the species we did capture via mist-netting were insectivores, one carnivore, and two omnivore species, which would not be affected by the lack

of fruiting food resources. A previous survey of the former Upper Essequibo Conservation Concession documented a total of 19 bat species, including all species captured during this study. However, they projected a much higher bat biodiversity (Lim 2007). It should be noted that the variables presented are not unique to this area and thus the low captures are not a true reflection of the bat diversity in the Acarai-Corentyne Corridor. Three of the species we reported (*Lophostoma silvicola, Phyllostomus elongatus*, and *Chrotopterus auritus*) were among the seven most abundant bat species in Brazil's Grão-Pará Ecological Station (Secretaria de Estado de Meio Ambiente do Pará 2011b). The records obtained with eDNA added, among others, seven species from the Phyllostomidae family. This confirms a higher diversity of phyllostomid bats in the area, a group commonly captured with mist-nets. Acoustic surveys have further expanded the bat species list by ~15 species (and counting), also primarily composed of insectivores and fishing bats. It is very likely that several of the records will remain as sonotypes until a Bat Acoustic Library is completed for Guyana or more acoustic studies are carried out in the region. To our knowledge, this is the first time that an acoustic study has been carried out in the region. The results justify its use in future bat surveys in Guyana—especially during non-optimal mist-netting conditions.

The majority of species documented by eDNA are those that frequent water edges (as eDNA was extracted via water samples), but eDNA also documented the presence of six opossum species including the woolly mouse opossum (*Marmosa demerarae*), eight small rodents including the Brazilian spiny tree rat (*Makalata didelphoides*), the Amazonian marsh rice rat (*Hylaeamys yunganus*), small-footed bristly mouse (*Nectomys rattus*), three arboreal rice rat species of the genus *Oecomys*, and 11 bat taxa. The confirmation of the presence of *Myotis riparius* and *Peropteryx macrotis* in the area will allow us to link some of the calls obtained in the acoustic surveys. The opossum and rodent species are primarily small-bodied and arboreal, hence difficult to detect with camera traps, transects, or through trail surveys or opportunistic sightings. Sherman live traps and pitfall traps are traditionally used to sample this small-bodied mammal community, however, the relative inefficiency of these methods for sampling Neotropical small mammal communities (Umetsu et al. 2006, dos Santos-Filho et al. 2006) and low number of potential trap-nights rendered these methods inappropriate for this rapid assessment. eDNA was effective in filling some of the gaps for these groups of mammals, but more intensive survey effort (particularly in the upper canopy) in the future may provide a more comprehensive view of the small mammal community of the Acarai-Corentyne Corridor—the subgroup of mammals most likely to contain species that are new to Guyana or even new to science.

Notable taxa

The hyperabundance of white-lipped peccaries was particularly notable, as they are considered Vulnerable by the IUCN Red List and have been largely absent from a number of previous camera trap surveys from Region 9, Guyana (Hallett et al. 2019, 2024a; Harris et al. 2023). Large-scale population disappearances in this species have been documented across their range, with large-scale movements (Bodmer 1990), overhunting (Vickers 1991), disease outbreaks (Emmons 1987), and density-dependent overcompensation (Fragoso et al. 2022) each proposed as drivers by researchers. The seemingly abundant white-lipped peccary population in the Acarai-Corentyne Corridor reiterates this area's importance in maintaining connectivity between Amazonian and Guiana Shield forests which allows for the recovery of populations subjected to declines that are common in this species. Protection of this region will ensure that the Guiana Shield and the Amazon may continue to function as a single unit for wide-ranging mammal species.

The relatively abundant and widespread nature of a number of game species of conservation concern, such as the lowland tapir (*Tapirus terrestris*, globally Vulnerable), giant armadillo (*Priodontes maximus*, globally Vulnerable), and red brocket deer (*Mazama americana*, globally Data Deficient), in the Acarai-Corentyne Corridor provides further evidence of the extremely low intensity of hunting pressure that they are subjected to. All three species are known to be susceptible to overhunting, with medium- and high-intensity hunting driving local extinctions (Wilkie et al. 2019) and low-intensity hunting pressure capable of driving local declines (Hallett et al. 2019). Declines in the populations of these key species can have significant negative effects on tropical forest ecosystems through decreased seed dispersal and seedling survival, changes in vegetation cover and composition, and functional compensation (Peres and Dolman 2000, Terborgh et al. 2001, Beck et al. 2013). Additionally, the globally Vulnerable giant anteater (*Myrmecophaga tridactyla*), detected in all camps, was a welcome sight to the mammals team since in Guyana this species is more associated with savannas than lowland forests. They are not as common or widespread as populations in the Rupununi savanna-forest mosaic (Hallett et al. 2019, 2024a)

where population densities are likely increased as a result of increased availability of insect prey.

We documented five out of Guyana's six wild cat species: jaguar (*Panthera onca;* Fig. 10Y), puma (*Puma concolor*), ocelot (*Leopardus pardalis*), margay (*Leopardus wiedii*; Fig. 10X), and jaguarundi (*Herpailurus yagouaroundi*). Jaguar and margay (both globally Near Threatened) are species of international conservation concern and all wild cats are protected in Guyana and included in Appendix I of CITES. Ocelots were the most common and widespread cat species. This is an expected result and is in concurrence with previous surveys from the region, as ocelots are an adaptable species and dominant in competition between small cats. Margays escape some competition pressure by taking advantage of canopy habitat more than other cats, a factor that may also limit camera trap data from reflecting true densities. Jaguarundis are also a wide-ranging and adaptable cat species, but their density tends to be highest in savanna and savanna-forest mosaic habitats (Hallett et al. 2024a), although the species also inhabits lowland terra firme forests (Hallett et al. 2019, 2024a; Harris et al. 2023).

Guyana's largest predators, jaguar and puma, were both documented at each of the camps. Multiple individuals, as well as adults and juveniles, were documented for both species. Pumas are the most widespread felid of the Americas, readily inhabiting forest and grassland habitats from northern to southern latitudes and serving as a primary indicator species for the health of prey species populations as their diet consists primarily of medium- and large-bodied terrestrial herbivores and frugivores (Foster et al. 2010). Their presence and relative abundance compared to other small carnivores provides yet another indicator of a sufficient prey base in the Acarai-Corentyne Corridor. Jaguars are the species most often associated with Neotropical forests, Guyana's national animal, and the most wide-ranging of all of the world's big cats (genus *Panthera*). Across South America, jaguar populations experienced declines of 25% of their range over the last 25 years, while jaguar habitat in Guyana remained 99% intact during the same period (Jedrzejewski et al. 2023). They are highly adaptable when it comes to habitat and prey but they do require large expanses of intact habitat with an abundant prey base free of conflict with people and livestock (Hallett et al. 2024b). Jaguars are another representative of the many large mammal species that will benefit from maintaining connectivity and genetic diversity between Amazon and Guiana Shield forests through the protection of the Acarai-Corentyne Corridor.

A highlight for our study is the record of the bush dog (*Speothos venaticus*, globally Near Threatened), which is a naturally rare and wide-ranging species that is highly carnivorous, an indicator of intact forest, and infrequently documented by any research techniques (de Souza Lima et al. 2012, Hallett et al. 2021). The species was confirmed through an opportunistic observation of a track at Camp New River. It has previously been recorded by Sanderson et al. (2008) based on interviews with Indigenous people. The species was recognized by local team members as present in the area but rarely observed.

Other notable species include the Neotropical river otter (*Lontra longicaudis*). It is considered more common and widespread than its larger counterpart, the giant river otter (*Pteronura brasiliensis*), but was only spotted once, likely due to the fact that it does not live in groups and does not vocalize frequently. The giant river otter, on the other hand, was recorded several times in groups as big as nine individuals during river transit between camps and in creeks.

Another highlight is the record of leucistic individuals of tayra (*Eira barbara*) in Camp Amuku and Camp New River (Fig. 10H). The individuals showed dark color in the snout and eyes. We also recorded individuals with typical fur coloration (individuals with dark brown body with head and neck gray-brown, yellowish, or dark brown slightly paler than the back). Leucistic individuals have been recorded previously in Guyana (Mendes Pontes et al. 2020).

CONCLUSION

The community of medium- and large-bodied mammals we recorded in the Acarai-Corentyne Corridor is similar to that of protected areas in Guyana and the Amazon basin with very well-maintained ecosystems. The corridor ranks intermediate in terms of the diversity of medium- and large-bodied mammal species compared to various protected areas and extensively researched regions in Guyana. Through our combined methodological approaches we recorded a higher number of species than previous studies conducted in neighboring areas such as the Grão-Pará Ecological Station (Secretaria de Estado de Meio Ambiente do Pará 2011b) and the former Upper Essequibo Conservation Concession (Sanderson et al. 2008). Many of the medium- and large-bodied mammals detected during this survey have broad distributions across forests of Central and South America. Many are targeted for harvest and trade, supporting livelihoods ranging from providing subsistence proteins to international trade networks. As a result, the mammal cohort

consists of more species of international conservation concern because of wide-ranging declining populations than any other taxonomic group.

Conservation of the Acarai-Corentyne Corridor from habitat loss and forest degradation (i.e., caused by legal and illegal mining and logging) preserves the bridge between the intact forests of the western Amazon basin and Guiana Shield, maintaining source-sink dynamics and genetic exchange between two of the world's last frontier forests—a phenomenal achievement for Guyana and a significant achievement for a rapidly developing world where vast wilderness areas are becoming a thing of the past. The Acarai-Corentyne Corridor contributes to making tropical wilderness, and its most charismatic species, part of all of our shared futures.

ENVIRONMENTAL DNA

Authors: Sophie Picq, Mariel Vandegrift, Gyanpriya Maharaj, Annalise Bayney, Ronell Lewis, and Samantha Garcia

Conservation targets: Heightened sensitivity for local monitoring of indicator species to evaluate goals and potential conservation threats; increased capacity for governmental institutions to complete environmental DNA field collection, lab, and computational processing; collection and barcoding of specimens to fill out gaps in the reference database, thereby increasing species resolution for future eDNA surveys; confirmation of new, rare, or threatened species that are otherwise difficult to detect

INTRODUCTION

In Guyana, field research on biodiversity mainly focuses on populations, species, and ecosystems. Aside from the agricultural sector, scant research has been conducted to understand biodiversity at the genetic level. Environmental data (eDNA) presents a unique opportunity for biodiverse countries such as Guyana, with large tracts of remote undisturbed forests, because it allows for easier and more cost-effective baseline assessments and monitoring. Additionally, eDNA can supplement traditional methods of data collection in which elusive organisms may not be detected. With minimal training, eDNA field surveys can be readily deployed by technicians and the results used to complement intensive surveys conducted by specialized taxonomic experts.

Once collected and extracted, eDNA samples can be stably stored at –20°C, where they can serve as a sort of biodiversity archive of protected areas. Continued eDNA monitoring could also be key to understanding changes in Guyana's diversity over time. Further, collected samples can be re-analyzed with different primer sets to target different taxa groups for new research questions. Using the same collected samples, more specific primer sets can achieve better resolution and more sensitively detect smaller taxa groups of interest, while incredibly sensitive single-species detections can be achieved using qPCR for species of interest. Additionally, as genetic reference databases continue to grow, bioinformatics pipelines can be re-run to achieve better taxonomic resolution on past projects, without the need to repeat lab processing.

This represents the first time that eDNA was incorporated in the Field Museum's 25-year history of rapid inventories and the first eDNA effort in the Acarai-Corentyne Corridor. Our team recently conducted a vertebrate-wide eDNA study at the Takutu and Ireng confluence waterways, where over 350 vertebrate taxa were identified within just 20 eDNA samples (de Souza et al., in preparation), confirming that the method is efficient to detect vertebrate species in similar, nearby habitats and that high species diversity can be recovered. In the Guiana Shield, eDNA was first applied in French Guiana, where Cilleros et al. (2019) showed that fish assemblages from different drainages were better discriminated using eDNA than conventional surveys. Since then, extensive work has focused on improving eDNA methodology specifically for the Guiana Shield, including optimizing protocols (Cantera et al. 2019, Coutant et al. 2021a, 2021b) and investigating the spatial dynamics of eDNA signal in water (Cantera et al. 2022a, Condachou et al. 2024). These studies have been crucial in generating powerful eDNA-based conservation analyses in the region. For instance, eDNA analyses along the Maroni and Oyapock rivers found that even small losses of forest cover were linked to declines of >20% in taxonomic and functional richness for both mammals and fishes (Cantera et al. 2022b).

Here, we used eDNA metabarcoding to simultaneously identify all vertebrates within the Acarai-Corentyne Corridor (namely, fishes, mammals, birds, reptiles, and amphibians). While eDNA can be collected from various sources such as water, soil, or air, we focused on water samples for ease of sample collection and processing and because of higher eDNA concentrations in water compared to soil and air.

eDNA definition

eDNA refers to genetic material that is shed by organisms in the form of skin cells, hair, mucus, feces, etc., and gathers directly in the environment. eDNA aggregates on or within environmental substrates like water, soil, or leaf surfaces,

which can be collected on a filter surface. The DNA can then be extracted, amplified, sequenced, and matched to species' reference sequences in order to produce species identifications for each unique filter and site. Thus, species of a variety of taxa can be easily detected by the DNA they leave behind, without the need of visual or auditory recordings or even specialized taxonomic experts.

eDNA species detection thus relies on matching DNA collected in the environment with known DNA barcodes for those same species. Therefore, previous genetic information for the organisms being surveyed is crucial to detect species using eDNA. When these genetic databases are complete, eDNA metabarcoding represents an efficient, non-invasive, and cost-effective approach to inventory biodiversity. Since eDNA samples encapsulate the entire genetic material present in the environment, they allow us to monitor a wide range of taxonomic groups at once.

As detailed in the previous, taxon-specific sections, it is evident that vertebrate diversity in the Acarai-Corentyne Corridor is incredibly high, although remarkably few conventional biodiversity surveys have been conducted in this region (for a synthesis of biodiversity information prior to our inventory, see the *Prior surveys* chapter on pages 85).

METHODS

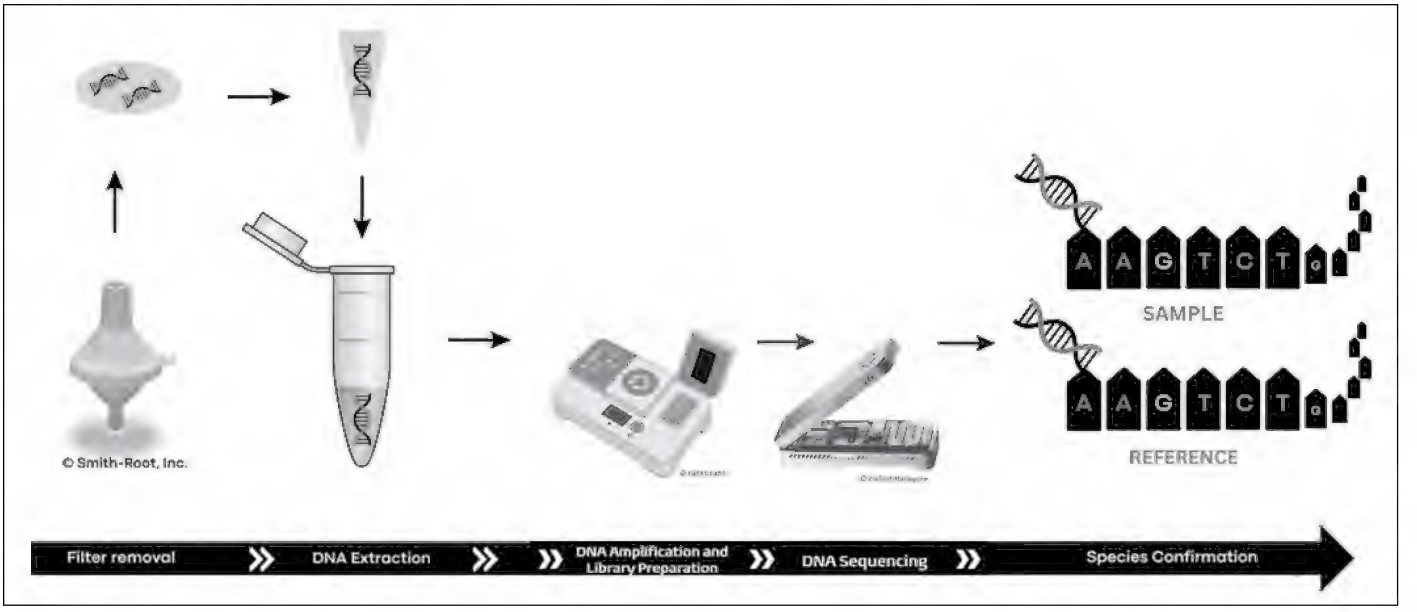
Before fieldwork

Building a DNA reference database for local vertebrate species

In an effort to optimize detection of vertebrate species through eDNA, we created a DNA database composed only of known DNA barcodes for vertebrate species of the region, as the accuracy of taxonomic assignment in eDNA metabarcoding studies can be improved if prior expectations of species occurrence are included (e.g., Gold et al. 2021, Kaehler et al. 2019). This process typically involves using external information about species abundance or presence, 'geographic filtering', or excluding from consideration species that are not reasonably expected to occur at a site (Pereira et al. 2021). To do this, we used the Map of Life Rapid Assessment dashboard to create a list of expected vertebrate species in a 100-km radius area around our sampling zone.

The genetic marker we targeted in our eDNA analysis is a small fragment of the 12S rRNA gene in the hypervariable V5 region (~110–120 base pairs; Riaz et al. 2011), which has been shown to be efficient in reconstructing entire vertebrate communities in a range of habitats (Picq et al. 2024). We therefore downloaded 12S rRNA sequences and associated taxonomic information from GenBank for expected vertebrate species in the vicinity of the Acarai-Corentyne Corridor using the CRABS (version 1.0.9) software and workflow. A total of 101 12S sequences, representing 64 fish species, were also generated in-house and added to our database. Sequences were

Figure 42. Overview of the main steps of the eDNA laboratory workflow to go from eDNA filter samples to sequencing with the minION portable sequencer.



trimmed to the primer regions, and all sequences with unique taxonomic annotations were retained, even if the sequences were duplicates (dereplication). Our local reference database contained a total of 1258 sequences: 325 sequences of 194 fish species, 228 sequences of 84 amphibians, 93 sequences of 56 reptiles, 296 sequences of 190 birds, and 316 sequences of 167 mammals. All reference sequences were quality-checked for nomenclatural errors in GenBank by plotting neighbor-joining sequence trees for each family. The neighbor-joining trees were constructed using the 'muscle' and 'ape' packages in R v4.4.0.

Fieldwork

eDNA samples were collected over a 21-day period across the three camps. At each camp, we sampled between 14 and 20 sites, generating 30–34 filters per camp including one blank per camp for a total of 97 eDNA filters. Our sampling coverage represented all aquatic habitats accessible by boat or by trail. Sampled water bodies encompassed two different river basins (the Essequibo and the Corentyne) and included the main river channels, tributaries, and streams, as we aimed to characterize species variation among the different habitat types. All eDNA collection sites are indicated on maps provided at https://doi.org/10.5061/dryad.m0cfxppg5.

We collected 1–4 water samples at each site, depending on the width of the waterbody and available microhabitat types. Water was pumped through self-preserving polyethersulfone (PES) membrane filters of 0.8-µM pore size and 47-mm diameter (Smith-Root Inc.) (Fig.13D) using either an eDNA Citizen Scientist Sampler vacuum pump (Smith-Root Inc.) or a peristaltic pump powered by a drill. Water was passed through each filter until the filter clogged. For each sample taken, we recorded total water volume filtered, microhabitat descriptions, as well as water temperature, pH, and dissolved oxygen, which were measured with a multiparameter water sonde (YSI).

Due to the nature of trace eDNA, contamination—or the accidental introduction of non-target DNA—can be easily introduced by improper handling. We controlled for contamination between sites by frequently changing gloves, and contamination between camps by sterilizing filter equipment with a 10% bleach solution at the beginning of each camp. One field blank per campsite was generated by filtering 1 L of distilled water with the sampling gear, in order to measure contamination introduced during handling and control for potential false positive results.

Collected filters were dried and stored in dark bags to prevent DNA degradation by UV light in the field. All filters were stored at ambient temperature in the dark until our return to Georgetown, at which point we placed the filters in –20°C freezers at the University of Guyana.

Laboratory work: Processing eDNA samples from extraction to sequencing

eDNA metabarcoding was carried out in two stages:

1) minION subset: A subset of 18 field samples (six per camp), representing a variety of habitat types, was processed at the Centre for Study of Biological Diversity at the University of Guyana (Fig.13C) using portable lab equipment to generate a preliminary list of species (Fig. 42) on 25–27 November 2024.
2) Full dataset: All 97 field samples, including three blanks, were then processed at the Field Museum from January to March 2025 using the Museum's Biomolecular Clean Lab and the Pritzker Laboratory for Molecular Systematics and Evolution.

Here we report results from both sequencing runs.

DNA extractions

MinION subset: 18 filters were cut into two pieces with sterilized scissors. One piece was then extracted at the University of Guyana with a Qiagen extraction kit (DNeasy Blood and Tissue kit) with some minor modifications. The other piece was preserved in a CTAB buffer and transported to the Field Museum for more thorough processing using the Illumina pipeline. To avoid contamination, extractions and PCR setup were conducted in a lab space free from animal tissues and PCR products.

Full dataset: All remaining eDNA samples were extracted at the Field Museum in the Biomolecular Clean Lab to avoid contamination using phenol-chloroform extraction methods as described in Picq et al. (2024).

Amplification of vertebrate DNA

For both the MinION and full datasets, amplification was carried out in the V5 region of the 12S ribosomal RNA region with a general vertebrate primer set that amplifies a ~100bp fragment (Forward: 5'-ACTGGGATTAGATACCCC-3', Reverse: 5'-TAGAACAGGCTCCTCTAG-3') developed by Riaz et al. (2011). Primers were modified to include an overhang on the 5'-end to allow for indexing and the addition of the appropriate sequencing adapters (ONT or Illumina) during the two-step PCR-based library preparation process. A 25µL first step PCR reaction was used with the following recipe: 14.95µL sterile water, 2.5µL 10× Amplitaq Gold buffer, 0.6µL 10mM

dNTPs, 2µL 25mM MgCl2, 0.8µL 10µM of each 12S-V5 primer, 0.25µL 5U/µL Amplitaq Gold DNA Polymerase (Applied Biosystems), 0.1µl 50 mgl/ml Bovine Serum Albumin, and 3µL of DNA. Thermocycling conditions were as follows: initial denaturation at 95°C for 10 minutes followed by 40 cycles of denaturation at 95°C for 10 seconds, annealing at 54°C for 30 seconds, extension at 72°C for 30 seconds, and final extension at 72°C for 5 minutes.

For the minION subset, all field samples were analyzed with three PCR replicates, while for the full dataset, 12 PCR replicates were performed, to better capture the diversity of DNA in each filter. Corresponding field negatives and lab negative controls were included to quantify the non-target DNA that may have been introduced by handling. Exogenous positive control communities of vertebrate species were included to quantify the rate of barcode-jumping, so that sequences could be assigned to localities with better confidence.

All replicates were pooled and amplification was confirmed by gel electrophoresis. PCR cleanup was conducted with ExoSAP-IT Express for the minION subset and with Serapure magnetic beads (Rohland and Reich 2012) at a 1.8X bead-to-PCR ratio for the full dataset. PCRs were then quantified with a Qubit Fluorometer.

Library preparation

For the MinION subset, eDNA library preparation was performed with the Oxford Nanopore Technologies Ligation Sequencing Kit (LSK-114) and PCR Barcoding Expansion 1-96 (EXP-PBC096). Sample concentrations were adjusted to contain 5 ng of DNA and unique barcode sequences were attached to each sample, negative, and positive. Samples were normalized to a standard concentration and pooled equimolarly. Bead cleanups were conducted with a ratio of 1.4X with Ampure beads. Following equimolar pooling, all library preparation was conducted according to the Oxford Nanopore Technologies Ligation protocol for end prep, adapter ligation, and loading. All samples were loaded on a MinION FlowCell (R10.4.1), and the MinION portable sequencer was run for a total of 10 hours.

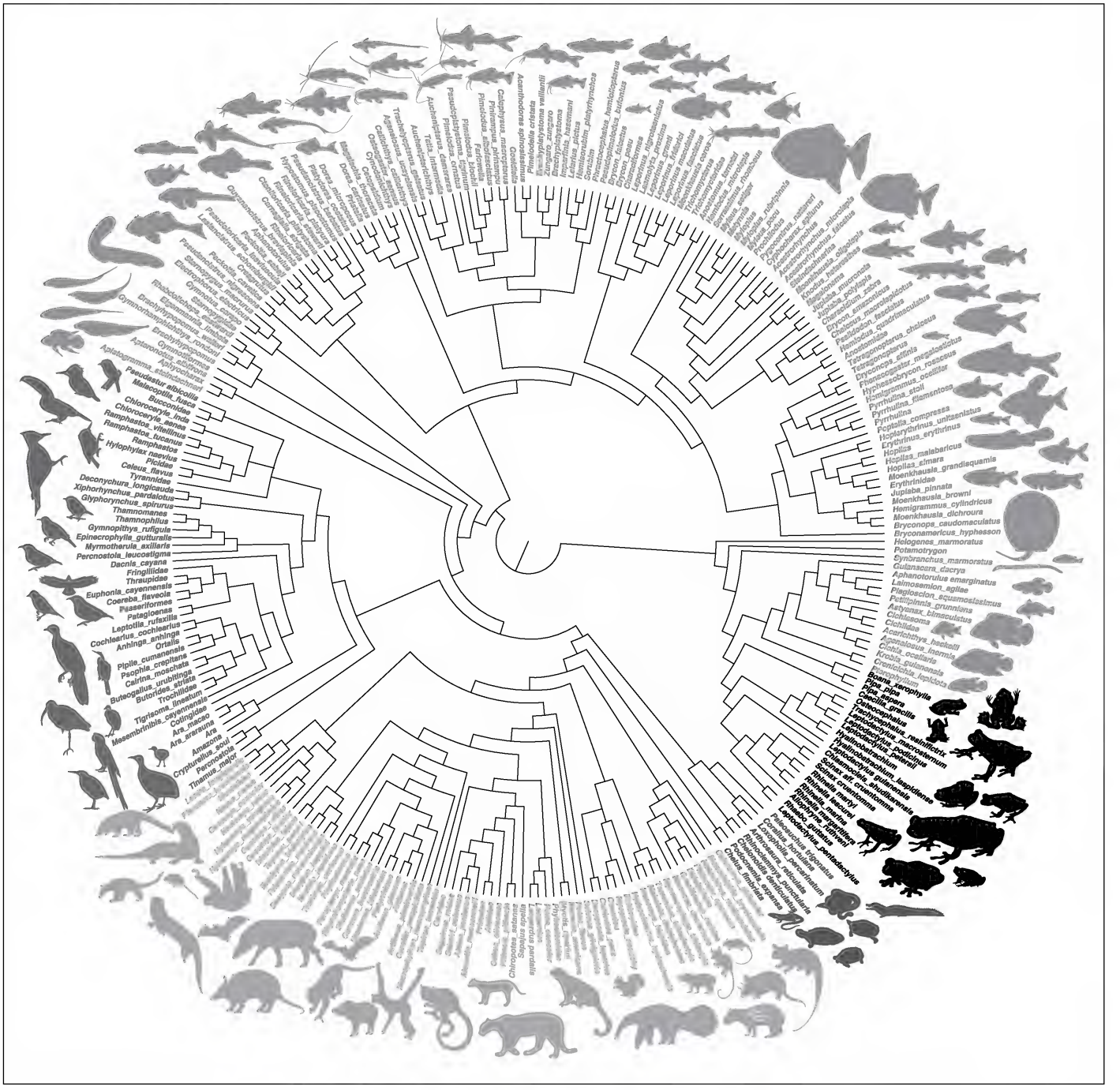
For the full dataset, sample concentrations were also adjusted to contain 5 ng of DNA and unique barcode sequences were attached to each sample, negative, and positive. All samples were again cleaned with Serapure at a ratio of 1.8X. Following equimolar pooling, all samples were loaded on an Illumina NovaSeq platform at the Northwestern University sequencing core.

Bioinformatic analyses: From sequences to species

For the MinION subset, sequencing was carried out on a MacBook Pro M1 8-Core CPU and 32 GB of unified memory on macOS Sonoma Version 14.5. Basecalling and subsequent bioinformatic analyses were performed at Michigan State University's High-Performance Computing Center. Our bioinformatics workflow is based on a pipeline developed by the Map of Life Rapid Assessments XPRIZE team. We used the 'high accuracy' (hac) model run via dorado software to perform basecalling during sequencing, resulting in FASTQ files of demultiplexed sequences. NanoFilt v2.8.0 was used to remove reads with an average quality score <10. We used seqkit v2.8.0 to remove raw reads outside of the expected length range (i.e., amplicon length + primer length + adapter length). Length filtering at this step avoids the need for chimera removal. Next, we trimmed off the primers from each read using Cutadapt v4.8, accounting for every combination of forward and reverse primer sequences. We set the Cutadapt error rate to 0.2 and combined the results from all Cutadapt passes, removing duplicated reads. We then used porechop v0.2.4 to remove any ONT adapters and barcodes from reads in which Cutadapt did not find both a forward and reverse primer sequence (i.e., reads with only one primer sequence removed via Cutadapt). Next, we clustered reads using the cluster_fast function from VSEARCH v2.27.1 with a global clustering threshold (id) of 0.95 to generate MOTUs (Molecular Operational Taxonomic Units). To guard against PCR and sequencing errors, we discarded any cluster with ≤5 reads.

To assign taxonomy to our environmental sequences, we performed BLAST (Basic Local Alignment Search Tool; the *blastn* function in BLAST+ v.2.15.0) searches on the consensus sequences from each cluster against our local reference sequence database. For any consensus sequences without a match of 95% or greater to the local reference database, we used *blastn* to perform a second search against the broader NCBI nucleotide sequence database for all eukaryotes (nt_euk), downloaded on 30 October 2024. We processed the *blastn* output using R, including removing sequences with an alignment length (query coverage) <90 base pairs. We used a threshold of ≥98% match to assign sequences to species and ≥95% to assign a genus-level identification. Within a threshold level, some sequences matched to more than one taxa; in these cases, we assigned the taxa of the most recent common ancestor (e.g., genus or family level). We removed common contaminant species, including humans, domesticated animals, and food items (*Gallus, Felis, Canis,*

Figure 43. A phylogenetic tree of the 306 unique vertebrate taxa detected via eDNA analysis of all samples within the Acarai-Corentyne Corridor. Distinct shading indicates different vertebrate classes.



Rattus, Mus, Equus, Ovis, Sus, Bos, Capra, Thunnus). In metabarcoding studies, barcode tag jumping can cause species detected in one sample to erroneously appear in another sample. To guard against this, we included an exogenous positive control containing a mock DNA community of species (seven fish, one reptile, one amphibian, and one bird) that do not occur in the study area. We determined the maximum within-sample proportion of any cluster assigned to a positive-control species (excluding the positive control, negative controls, and samples with less than 10,000 reads). We then moved any cluster equal to or less than this proportion to the 'unclassified' sample category. For each sample-cluster combination, we subtracted the maximum number of reads found in negative samples for the cluster (if the cluster was

present in a negative control). If the resulting number of reads was equal to or less than zero, we removed this cluster.

Bioinformatic processing of the full Illumina dataset was conducted using QIIME2 v2024.10 (Boylen et al. 2019). Briefly, raw demultiplexed reads were trimmed using Cutadapt v-4.2 (Martin et al. 2011), with a maximum error rate of 0.25. Trimmed reads were then denoised to remove putative PCR and sequencing errors using DADA2 v1.26.0 (Callahan et al. 2016) and the '*pseudo*' pooling setting, with the additional parameters '*p-trunc-len-f 95*' and '*p-trunc-len-r 95*,' resulting in 3553 amplicon sequence variants (ASVs).

As in Picq et al. (2024), taxonomic assignment was carried out via a hybrid approach, first prioritizing exact matches using the global-aligner VSEARCH (Rognes et al. 2016) and then retaining Naive Bayes classifications (Bokulich et al. 2018) with sufficient taxonomic information. The Bayesian classifier was trained using the RESCRIPt command 'qiime rescript evaluate-fit-classifier', producing the QIIME object required for kmer-based classification. For VSEARCH, 100% identity across at least 94% query coverage was required with 'qiime feature-classifier classify-consensus-vsearch'. Only ASVs with at least family-level taxonomic classifications were retained from this initial alignment-based classification (n = 240). All other remaining ASVs were then classified with the Bayesian classifier, using 'qiime feature-classifier classify-sklearn' with default parameters. Similarly, only ASVs with family-level taxonomic classifications were retained (n = 3185). Lastly, nucleotide BLAST (Altschul et al. 1990, Camacho 2009) was used to query all other ASVs that were not assigned taxonomy by previous classifiers to account for other possible vertebrate species not present in the taxonomic database, requiring matches ≥98% percent identity for at least 95% query coverage. A total of 128 ASVs with a minimum family-level taxonomy were retained.

Sequences that had either no taxonomic assignment, or no assignment at least at the phylum level, were discarded. Similarly, sequences assigned to humans, domesticated, or farm animals were considered as common contaminants and removed. To control for tag jumping, we included two exogenous positive controls containing two mock DNA communities of species that do not occur in the study area. We determined the maximum within-sample proportion of any ASV assigned to a positive-control species (excluding the positive control and negative controls). We then moved ASVs equal to or less than this proportion (0.0009) to the 'unclassified' sample category. For each sample, we subtracted the maximum number of reads found in negative samples for each ASV (if that ASV was present in a negative control). If the resulting number of reads was equal to or less than zero, we removed this ASV from the dataset.

For both datasets, all taxonomic identifications were reviewed by taxonomic experts within our team to control for potential false positives. Rarefaction curves were generated using the R statistical software package 'iNEXT' (Chao et al. 2014).

RESULTS

MinION subset sequenced at the University of Guyana in November 2024

For the subset of 18 filters, our eDNA analyses identified 243 vertebrate taxa with unique taxonomic labels belonging to 127 genera, 54 families, and 24 orders from five vertebrate classes (ray-finned fishes, Mammalia, Aves, Amphibia, and Reptilia). Of those 243 taxa, 116 (48%) could be resolved to species: 82 fish, seven amphibians, three reptiles, six birds, and 18 mammals. Over half of the sequences in this preliminary dataset could not be labelled with a species identification, but only at genus or higher taxonomic ranks. This could be due to incomplete information in our DNA reference database, as we are still missing genetic information from many vertebrates known to occur in this area. It could also be due to the higher sequencing error rate of the minION sequencing platform, where random errors are introduced.

Analysis of all samples

Our Novaseq run of the 97 eDNA samples identified 282 vertebrate taxa from the same five vertebrate classes. A total of 24 taxa were detected in our preliminary MinION run that were not detected in our Novaseq run: four fish species, 13 fish genera, three frog species, two bird species, and two bird genera. These were added to the final species list detected by eDNA methods (Appendix 8), for a total of 306 taxa, with unique taxonomic labels belonging to 155 fishes, 22 amphibians, eight reptiles, 51 birds, and 70 mammals. This amounts to a total of 208 genera, 96 families, and 37 orders (Fig. 43). Of those 306 taxa, 221 (72%) could be resolved to species: 106 fishes, 20 amphibians, eight reptiles, 32 birds, and 55 mammals. Forty-seven (16%) were resolved at the genus level and 38 (12%) at higher taxonomic levels.

eDNA methods identified 90 vertebrate species that were not found by any other method (55 fishes, four amphibians, two reptiles, three birds, and 36 mammals). In terms of mammals, 15 of the taxa only detected by eDNA were smaller rodents or opossums that are difficult to detect with camera traps due to their size. eDNA documented the presence of six

Figure 44. A Venn diagram comparing the number of fish species detected along the Acarai-Corentyne Corridor using eDNA (**B**) vs. conventional fishing methods (**A**), such as gill nets, seining, etc. Percentages indicate the proportion of total fish species detected by each method separately and by both methods.

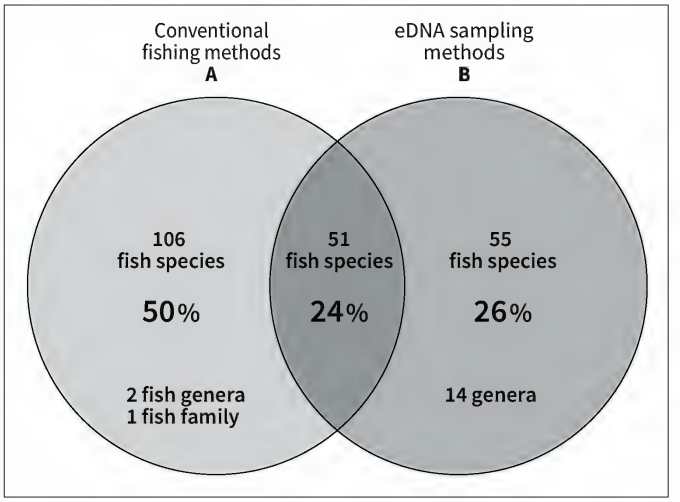
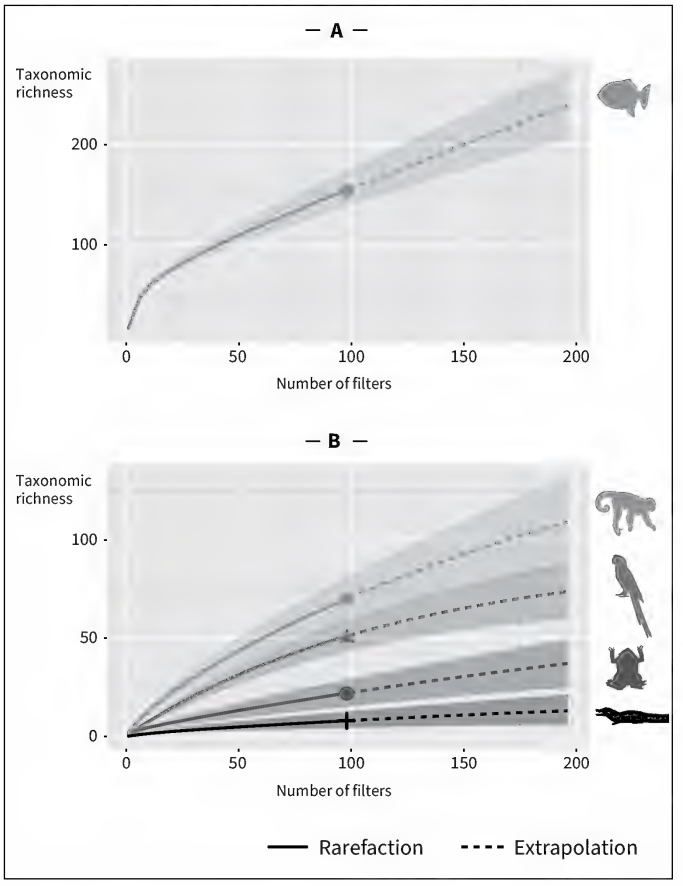


Figure 45. Sample-based species accumulation curves for fish (**A**) and other vertebrate groups (**B**) according to the number of all eDNA filters analyzed. Solid lines reflect real data and dotted lines extrapolations. Shaded areas represent 95% confidence intervals.



opossum species, including the woolly mouse opossum (*Marmosa demerarae*); eight small rodents including the Brazilian spiny tree rat (*Makalata didelphoides*), the Amazonian marsh rice rat (*Hylaeamys yunganus*), small-footed bristly mouse (*Nectomys rattus*), and three arboreal rice rat species of the genus *Oecomys*. Similarly, eDNA detected a species of the genus *Philander*. Since the mammal team recorded a member of the family Didelphidae, which they considered to be either *Philander opossum* or *Metachirus nudicaudatus*, eDNA increases the likelihood of it being the former. The remaining 11 mammal species detected only by eDNA are bats that may have been hard to catch by mist-netting during full moon conditions.

Among the 55 fish species detected only by eDNA, many are difficult to collect using nets as they live in rocky or wood debris habitats. eDNA analyses also identified four species of frogs not detected by other methods, namely *Hyalinobatrachium iaspidiense*, *Boana xerophylla*, *Leptodactylus macrosternum*, and *Pipa aspera*. *Pipa aspera* actually represents a new record for Guyana, showing that eDNA is a powerful complement to conventional sampling methods for rare and elusive taxa. Two reptile species were also detected by eDNA and not by other methods, namely the mata mata freshwater turtle (*Chelus fimbriata*) and the spot-legged wood turtle (*Rhinoclemmys punctularia*). Interestingly, these two species were only detected in the headwater stream of the New River drainage at Camp Monkey Jump, where the herpetology team was not able to sample.

Among all taxa detected by eDNA, eight are of conservation concern, namely giant South American river turtle (*Podocnemis expansa*, Endangered), giant river otter (*Pteronura brasiliensis*, Endangered), black-bearded saki (*Chiropotes satanas,* Endangered), giant anteater (*Myrmecophaga tridactyla,* Vulnerable), lowland tapir (*Tapirus terrestris*, Vulnerable), red-faced black spider monkey (*Ateles paniscus*, Vulnerable), giant armadillo (*Priodontes maximus*, Vulnerable), and pacu (*Myleus pacu,* Near Threatened).

With 155 taxa—belonging to 10 orders, 33 families, and 99 different genera—fish dominated the vertebrate classes detected by eDNA, with 106 unique fish species and 31 additional genera that were not able to be resolved at the species level (Fig. 43). eDNA methods recorded 55 fish species as well as 14 genera that were not detected by the fish team with conventional sampling methods (Fig. 44). In contrast, 106 fish species, three genera, and one family were detected only by conventional fish methods. Fifty-one fish species were identified by both methods.

After fishes, mammals were the most detected group, with 70 total taxa, among which 55 were identified at the species level. Forty-seven bird taxa were also detected, including 32 at the species level. Nineteen different amphibian taxa and eight taxa of reptiles were also detected, among which all were identified at the species level except for two amphibians.

Species accumulation curves of taxonomic richness for the five vertebrate groups showed that fish taxonomic richness grew more rapidly than that of any other vertebrate group, followed by mammals and birds (Fig. 45). Fish, mammal, bird, and amphibian curves showed no indication of reaching a plateau, indicating that more species would be detected with more filters. The accumulation curve for reptiles increased at a slower rate, indicating that more filters would not necessarily yield more species identifications.

DISCUSSION

Our analysis of 97 eDNA filters from the Acarai-Corentyne Corridor yielded an impressively diverse list of 306 vertebrate taxa. A total of 221 species were detected with another 85 taxa detected at lower taxonomic levels. Higher levels of species diversity are expected once genetic samples collected on this trip (fish, reptile, amphibian, and mammal tissues) are sequenced and added to the DNA reference database. This will yield greater taxonomic resolution for this study as well as future studies in the region.

Unsurprisingly, due to the aquatic sampling methods deployed, fish were the best represented class (Fig. 43). Compared to the conventional fish collection methods deployed in this inventory, 26% of all fish species were only detected by eDNA. The majority of fish species detected only by eDNA methods are catfish in the Siluriformes order. These are often found in habitats that are hard to sample thoroughly with nets, such as rocky habitats or woody debris, that provide many alternative shelters for fish trying to avoid nets. eDNA is therefore especially complementary to conventional sampling in hard-to-sample habitats. eDNA was also able to detect certain species that may have been rare as the fish team expected to detect them but did not, such as the red-bellied piranhas (*Pygocentrus nattereri*), which were detected at a relatively low abundance only at Camp New River in the New River basin. In contrast, 50% of all fish were only detected by conventional fishing methods (Fig. 44; see also the *Fishes* chapter on page 117). Of these species, the majority (102 out of 106 species, 96%) have no available genetic information yet, and were thus unable to be detected by eDNA methods. This highlights one of the major opportunities for Guyana to build local capacity: the sequencing of specimens collected in-country. These local and regional reference databases are essential for the continued monitoring of protected areas and a greater understanding of Guyana's genetic biodiversity. This effort has already been initiated as close to 500 tissues from specimens collected during this inventory are currently being sequenced for three different mitochondrial genes (COI, 12S rRNA, and 16S rRNA) by our partners at the Canadian Center for DNA Barcoding. Re-analysis of our data with this more complete local database will certainly increase our species list. This expanded DNA reference database for Guyanese biodiversity will also empower future eDNA studies in Guyana and allow a more thorough understanding of vertebrate diversity. As shown both in this chapter and the *Fishes* chapter on page 117, fish species accumulation curves from the rapid inventory suggests that further collecting in the Acarai-Corentyne Corridor will undoubtedly yield more freshwater fishes species (Figs. 29, 45). Based on the findings in this inventory, it is very likely that many of these species will be new to Guyana or new to science.

Non-fish DNA represented 49% of vertebrate diversity (Fig. 43), demonstrating that aquatic eDNA samples are incredibly efficient at monitoring a wide range of terrestrial taxa. This is further evidenced by the detection of five terrestrial species of conservation concern: black-bearded saki, giant anteater, lowland tapir, red-faced black spider monkey, and giant armadillo.

eDNA was particularly effective in filling some of the gaps for the small-bodied and arboreal groups of mammals that are difficult to detect with camera traps or opportunistic sightings. In addition, eDNA methods significantly increased bat species detections, adding seven species and one genus to the Phyllostomidae family, as well as two species to the Emballonuridae family, and one species to the Vespertilionidae family. This confirms a higher diversity of phyllostomid bats in the area, a group commonly captured with mist-nets. These results justify the use of eDNA in future bat surveys in Guyana—especially during non-optimal mist-netting conditions.

In terms of amphibians and reptiles, eDNA helped detect elusive reptile species. eDNA techniques, by sampling all kinds of aquatic habitats, including ponds within the forest and terra firme rivulets, allowed us to detect taxa such as the Mata mata turtle (*Chelus fimbriata*) and the smooth-fronted caiman (*Paleosuchus trigonatus*). Since our herpetology team had to survey a wide range of habitats and could not solely focus on aquatic types, eDNA methods particularly helped fill the gap for aquatic amphibian and reptile species. The low detection of

reptiles was not completely unexpected given similar findings in other studies, including some using the same primers (Raemy and Ursenbacher 2018, Adams et al. 2019, Zhang et al. 2023, Picq et al. 2024). The sampling period of our study (dry season), when reptiles are less active and breeding activity is low, may have contributed to these low detection rates. Indeed, studies have shown that the seasonal activity of species influences eDNA availability (de Souza et al. 2016) and that reproduction periods are also associated with higher concentrations of eDNA (Spear et al. 2015, Curtis et al. 2021).

Our eDNA methods identified three bird species that were not identified by our ornithology team, namely the boat-billed heron (*Cochlearius cochlearius*), the white-chested puffbird (*Malacoptila fusca*), and the little tinamou (*Crypturellus soui*). While the first two species were detected by all of the other six regional bird surveys in the area, the last one was only identified by three of these surveys. Three other species of the *Crypturellus* genus were detected by our ornithology team that are associated with forest habitat, namely *C. variegatus, C. cinereus,* and *C. brevirostris*. This indicates that the little tinamou may be rare in the area, which is also indicated by the low number of reads assigned to this taxon in our eDNA dataset.

Overall, our eDNA dataset identified an incredibly diverse vertebrate community, indicating that the Acarai-Corentyne Corridor supports healthy ecosystems capable of sustaining complete mammal, fish, reptile, amphibian, and bird communities. Conservation of this area from habitat loss and forest degradation will help maintain the connection between two of the most biodiverse and healthy forest ecosystems in the world, namely the Guiana Shield and the Amazon rainforests.

LOCAL ECOLOGICAL KNOWLEDGE

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Conservation targets: Robust intergenerational knowledge transmission in local Indigenous communities from moving through, understanding, and relating to the forests of southern Guyana; continued vitality of locally spoken Indigenous languages, including Waiwai, Wapishana, and Trio; hunting, fishing, and gathering areas abundant over the long term with food sources and culturally important materials; holistic knowledge of the landscape, allowing for timely observation of changes and threats to the ecosystem; local ecological knowledge and culturally-grounded values of nearby community members which continue to shape decision-making regarding resource use; co-constructed understandings of the area's biodiversity and ecology through collaboration between scientific and local ecological knowledges

INTRODUCTION

Local ecological knowledge is a significant part of how Indigenous people attend to the well-being of both their communities and lived environments. Documenting Indigenous peoples' observations of and knowledge about environmental processes as well as ideas about and practices of caring for and using local resources builds an understanding of the wider cultural assets and values of Indigenous communities, which are an important basis for the conservation of biological and cultural diversity in South America (Wali et al. 2017). Encompassing knowledge as well as practices, local ecological knowledge can be expressed, shared, or strengthened through stories and other forms of cultural memory, language and names for places and beings, direct and long-term observations through activities like hunting, fishing, and collecting, and other place-based practices like swidden agriculture and craft production. Gathering information on local ecological knowledge also contributes to more robust information about the forests and biodiversity of the Acarai-Corentyne Corridor, utilizing an ethnoecology approach that focuses on how local people understand the relationship between human beings and the environment (Prado and Murrieta 2015). In addition to encouraging dialogue and co-production of biodiversity information by local people and visiting biologists, the objective of the local ecological knowledge research was to document key forms of place- and practice-based environmental knowledge that experts from nearby Indigenous communities maintain and transmit across

generations, and evaluate their significance for future conservation decision-making and management.

Our approach focused on identifying and valuing the already existing knowledge of the Corridor from experts in the nearby Indigenous communities of Masakeñarî, Parabara, and Cashew Island, who reside on or use the main rivers as well as some trails and other places within the Corridor as part of what makes living well possible for them. Throughout the rapid inventory, local experts from the three communities demonstrated extensive, holistic understandings of the ecosystems, animals, plants, and physical elements of the Acarai-Corentyne Corridor. Their contributions strengthened the research team's collective understanding of the landscapes, their composition, important ecological dynamics, and their social and cultural significance. Local ecological knowledge played an important role in deepening, contextualizing, and raising new questions about what was observed or collected using Western scientific methods, as the biological taxonomic research took place over a three-week period and focused on three sites selected across southern Guyana's expansive forest landscape. Local experts have detailed knowledge of diverse flora and fauna, classification systems for forest types, and comparative perspectives on species distribution and seasonal variation across the landscape. Again and again, their perspectives applied a holistic approach to emphasize relations and interconnections between different species, suggesting local experts are best positioned to observe variations in the forest ecology—and their potential consequences—as part of potential future conservation management in the area. The ethnoecological data presented in this chapter is also valuable in and of itself as it shows the robust and vital way through which Indigenous peoples know and relate to these forests, and to each other, across the Acarai-Corentyne Corridor, and therefore the immense opportunity for their central role in conservation decision-making in this landscape.

METHODS

The ethnoecological research component of the rapid inventory started from the premise that neighboring Indigenous communities share knowledge, make decisions, and maintain attitudes, values, and aspirations that underpin the ways of living they collectively pursue. We approach these as social and cultural assets that have the potential to contribute to forms of care for and management of the territory that are significant for conservation action. Social assessments on previous rapid inventories conducted research in local communities themselves to document local ecological knowledge, history, values, practices, and aspirations in activities ranging from workshops and focus groups to interviews and mapping activities, an approach that was integral to successful protected area creation processes (Pitman et al. 2021). In this rapid inventory, all research took place in forest campsites and the participation of local experts focused on their knowledge of the landscape, representing a narrower thematic scope that was nonetheless consistent with the long-standing assets-based approach. Other lines of inquiry that were not part of this rapid inventory, such as documenting natural resource use, local modes of making decisions and coordinating action, as well as local and collective visions for the future, will likely be valuable in future follow-up work to secure effective and equitable conservation for this area.

The local ecological knowledge research team worked at all three campsites visited during the rapid inventory: Camp Amuku for five days, Camp Monkey Jump for four days, and Camp New River for six days (see Figs. 4B–D and the *Regional panorama* chapter on page 89 for a detailed description of these localities). In that time, we worked with 24 local experts, all of whom were men: 13 from Masakeñarî Village at Camps Amuku and Monkey Jump; three from Parabara Village at Camp Monkey Jump; and eight from Cashew Island Village at Camp New River. Each village agreed to participate in the rapid inventory and selected residents for work as camp and trail builders or boat captains during the advance phase, with a subset of those individuals self-identifying their interest in continuing to work in guide or support roles during the rapid inventory itself. This subset formed the group of 24 local experts. All those individuals agreed to take part in the local ecological knowledge research following a meeting about the purpose and other details of the research, making clear that their participation in local ecological knowledge research was not a requirement for working with the rapid inventory team. With a few exceptions, local experts also supported all fieldwork carried out at these camps by biological taxonomic experts, walking the trail system and navigating the rivers and creeks with visiting biologists. During that time, Oakley, Campbell and Yamochi accompanied selected data collection activities with the taxonomic teams for vascular plants, mammals, fishes, birds, and amphibians and reptiles. That entailed walking a segment of the trail network or traveling by boat as taxonomic teams conducted field surveys and, where applicable, specimen collection. Local ecological knowledge was documented through field interviews with local experts based on observed species, landscape features and habitat

types along the trails or waterways, and their cultural significance (Figs. 11C, 11E, 11M). Data was collected using ethnographic fieldnotes as well as through an ArcGIS Survey123 application developed to compile photographs, audio recordings, and typed notes on geotagged and time-stamped entries and allow coding for topics like seasonality, species commonness, distribution, and cultural significance.

Participating in and observing the biological fieldwork created opportunities for informal interviews as well as documentation of the biological data collection process as implemented by local experts and outside scientists on the taxonomic teams. Additional data collection took place in the campsites themselves through a range of activities with local experts, including: free-listing of expected species, indicator species, and/or important species for each taxon; checklist interviews based on photographs of selected well-known or conservation priority species; documentation of local names alongside scientific names of species observed or expected in the area; and dialogue between local and scientific explanations of features of landscapes, ecosystems, and species (e.g., seasonal dynamics; abundance and distribution of species; change over time).

It is important to note that the composition of participants in the local ecological knowledge component shaped the results described here. As all local experts that we worked with were men, our results do not speak to the wealth of knowledge of the forest maintained and practiced by women from the three communities (see, for example, Mentore 2024). Selection processes in the villages emphasized the work of trail cutting and campsite construction for advance work, for which men put their names forward, and returning local experts for the main data collection were drawn from that group. The relatively smaller group from Parabara resulted from a timing gap between Camp Monkey Jump construction and fieldwork—meaning most preferred to make the multi-day journey back home—as well as the need for a larger number of Masakeñarî residents to support roundtrip boat travel between Camps Amuku and Monkey Jump and Gunns Strip, near Masakeñarî, where the team arrived and departed by aircraft. Additionally, our research team spent relatively more time with the vascular plants, mammals, and fishes teams in the field, while engaging with the herpetology and bird teams more within the campsites before or after their day's or night's fieldwork.

RESULTS

Indigenous peoples make close and detailed observations of plants, animals, soil types, and other ecological aspects of the landscapes they move through. Local experts from Masakeñarî, Parabara, and Cashew Island consistently characterized biodiversity and landscape features that they encountered while collaborating with visiting social and biological scientists along the trail systems and waterways. The social connectivity between people in Masakeñarî, Parabara, and Cashew Island, as well as with other Indigenous peoples living in nearby parts of southern Guyana, northern Brazil, and southern Suriname (see the *Social landscape* chapter on page 170), appears to reinforce robust local ecological knowledge even about regional-scale variations, from awareness of different fish communities across watersheds to perceptions of shifts in common plants. Though the content of collaborations between local experts and visiting biologists varied, all biological teams reported that the extensive depth and breadth of local ecological knowledge enriched their taxonomic inventory of the biodiversity of the Acarai-Corentyne Corridor. But beyond the taxon-specific expertise of most biologists, local experts repeatedly demonstrated a holistic approach that situated individual species and even plant and animal communities in terms of their relations to types of terrestrial and aquatic places, to seasonal transformations of the landscape, and to other non-human beings.

The local ecological knowledge results presented here follow that structure, foregrounding the characterizations of local experts and maintaining a cross-disciplinary approach throughout. First, local experts' characterizations of habitat types and waterways show their capacity to differentiate and comparatively analyze the forests of southern Guyana, which makes the expertise of participating communities an important asset for monitoring this large landscape even beyond familiar or previously-visited areas. Second, local ecological knowledge accounts for seasonal and year-to-year transformations, contextualizing direct observations of the landscape in Indigenous knowledge of cycles of seasonal rainfall or plant and animal reproduction accrued over generations. Detailed attention to seasonality shapes the ways that local communities use resources in sustainable ways, but further offers an asset to conservation monitoring for anomalous ecological and hydrological dynamics requiring further study or management interventions. Third, local ecological knowledge of plants and animals holistically situates individual species, many of which the rapid inventory team documented Indigenous language names for

(Appendix 9), in their connections to other species (including human beings) across the landscape, which we describe as multispecies relations. Indigenous peoples' attention to the cascading effects linking species across the landscape—almost always across taxonomic groups—allows them to notice small variations and interpret their significance for forest ecology, knowledge that is essential to adaptive conservation management.

Local perspectives on the landscape

Forest types

Conversations while walking the trail system and small-group discussions at each camp revealed five broad forest type categories that local experts from Masakeñarî, Parabara, and Cashew Island differentiate: 1) upland forests, 2) swampy inland forests, of which there are multiple types, 3) seasonally flooded riparian forests, 4) vine-dominated areas, and 5) mountain areas (Table 13). These forest types were initially identified by Oakley asking Masakeñarî experts how they would refer in the Waiwai language to areas in Camp Amuku while walking together along the trail system (Fig. 11C), taking reference photographs and recording the location in the Survey123 app. Back at camp, Oakley, Yamochi, and Campbell compiled the Waiwai words and discussed their characteristics and differences with other Masakeñarî experts, a process led by Yamochi. The Waiwai language forest types were refined through further trail walking identification at Camps Monkey Jump and New River. In total, habitats were identified on trail walks across a total of nine days with eight different Waiwai speaking experts. Yamochi and Campbell facilitated small group discussions with Wapishana speakers from Parabara (Fig. 11L) and Trio speakers from Cashew Island at Camps Monkey Jump and New River, respectively, to review the Waiwai language categories. We found that all three Indigenous languages shared similar ways of differentiating forest types, with some variation on types of swampy inland forest that led us to group these together under an overarching category, discussed further below. All three Indigenous languages also have words to describe types of savannas but we did not encounter those habitats on the trail system.

Mature upland forests cover >80% of the Acarai-Corentyne Corridor (see Fig. 6A and the *Vegetation* chapter on page 109). For local experts, these areas are notable in terms of their tree diversity, including hardwoods, and characterized by the fact that they never flood. In previous Waiwai translations of conservation materials (Rapid Assessment Program 2008), Masakeñarî residents use their word for these upland forests, '*comota*,' to interpret English language concepts like forest ecosystem, suggesting the broad cultural significance of this forest type for local communities. Local communities select areas of upland forests close to rivers or creeks for their village sites and for swidden agriculture plots, paying close attention to the quality of the soil: in Waiwai, the ground at these once-and-future farms is described as '*axawa roowo ke ceske*,' a mixture of fine loose sand with very dark soil (Fig. 11N). Mature upland forests, in general, are important areas for hunting, especially of primates, as well as for collecting a wide variety of culturally useful plant materials, from housing materials to medicines to trees used for boats and bows and more. As these mature upland forests are both the most common, by land cover, and the most culturally significant in terms of the uses described above, it is helpful to think of them as almost a general type against which other forest types are contrasted in terms of locally salient differences.

Swampy inland forests have different drainage patterns and plant composition compared to upland forests, and local experts describe them primarily in terms of the palm species that is dominant in a given patch. Put another way, from the perspectives of local experts the abundance, and sometimes mixing, of particular tree species is the defining feature of swampy inland forests, which local experts see as heterogeneous. The most common type of swampy inland forest that we encountered with Waiwai-speaking local experts on the trail system was called *wapu*, characterized as the wettest of the inland areas with many açaí palms (Waiwai: *manaka*; *Euterpe oleracea*) and some turu (Waiwai: *kwanamari*; *Oenocarpus bataua*) palms. *Wapu* swamps are important hunting areas for peccaries, whose tracks we consistently encountered in these forests, along with the physical presence or scent of a recently departed herd on some occasions. Other areas are named for the presence of other tree species that local experts see as characteristic: *kwanamari* (turu; *Oenocarpus bataua*) areas that dry out seasonally, a sub-type of similar areas named *watapa* (*wallaba*; *Eperua* sp.) for the abundance of this non-palm species, and *yowu* (*ité*; *Mauritia flexuosa*) areas that are muddier than *wapu*.

Rather than strictly exclusionary categories, or rigid characterizations of species commonness, the sub-types of swampy inland forests are one register through which local experts describe the forest in terms of what they find noteworthy about it. Such categories illustrate a strong attention to variation across the territories they know well or encounter while traveling. Interviews about forest types

Table 13. Forest types of the Acarai-Corentyne Corridor of southern Guyana identified by Waiwai, Wapishana, and Trio Indigenous experts during the 2024 rapid inventory, and their corresponding names in those three languages.

Forest Type	Waiwai	Wapishana	Trio
Upland forests	comota	inawaz	itu
Flooded or swampy inland forests	waapu, kwanamari, watapa, yowu	wabao, oturobao, diewbao	wapo pata, kumuima pata, totopo pata, koy pata
Seasonally flooded riparian forests	krarasî	izkarabao	itoto
Vine-dominated forests	apasî	kazidairobao	inkarĭ
Mountain or highland forests	îipî	midikiu	pĭĭ

revealed that local experts often narrate travel through the forest, such as along hunting trails or other routes, in terms of the sequence of forest types that one would pass through, such as giving directions about what to expect along the way or clarifying where past events took place. Further, local experts compare across larger forest landscapes in terms of differences between the composition of swampy inland forests that occur there. After walking the trail system at Camp New River, Yamochi noted what he perceived as a relative lack of *yowu* (*Mauritia flexuosa*) dominated swamps in comparison to his experience in the forests along the upper Essequibo River at Camps Amuku and Monkey Jump as well as his long-term residence in Masakeñarî. Cashew Island experts agreed with his assessment, explaining that, based on their own experiences, individual *yowu* palms were more sporadically distributed along the New River, rather than growing together in an ité-dominated swampy patch. The plants team independently made a similar observation of solitary *Mauritia flexuosa* trees along the riverbank near Camp New River (see the *Vegetation* chapter on page 109).

The remaining three forest types—seasonally flooded riparian forests, vine-dominated forests, and mountain or highland forests—are defined in terms of other qualities than their plant composition, though local experts certainly observed those differences too. Seasonally flooded riparian forests were characterized in terms of the relative visibility through the understory, speaking to the presence of smaller-diameter trees and little to no vines shaped by the rainy season inundation of these areas. Vine-dominated forests, by contrast, were described through their relatively closed-in visual field, which led local experts to categorize those areas together regardless of the different ecological processes that support vine-dominated plant communities, from recent tree falls to rocky terrain. The last category we identified was mountains (Waiwai: *îipî*). While we interpreted the category as differentiating montane or high-elevation forests from upland forests, the Waiwai word seemed to refer more to the mountain than to a forest type per se. We accessed only one area identified by local experts as a mountain (Amuku Mountain; Waiwai: Wiira Yipîn) and passed at the foot of one other (Kamoa Mountain), both at Camp Amuku. However, Masakeñarî experts with previous experience in the higher-elevation Acarai Mountains and other individual mountains in the Kanashen Amerindian Protected Area provided a broad characterization of *îipî* in terms of their smaller trees compared to mature upland forest, scrubby understories, and often rocky terrain (see also Kelloff et al. 2011, 47–49). Local experts find some culturally useful plant species only in mountain areas. While the plant team found similar species compositions for mature upland forest and the Amuku Mountain area surveyed, Masakeñarî experts did observe an important vine (Waiwai: *curare*) used in primate hunting and described how they only find it in similar mountain areas, not in upland forest.

Indigenous language forest types identified by local experts are similar to the classification of major vegetation types created, largely independently, by visiting botanists on the plant team (see Fig. 6A–D and the *Vegetation* chapter on page 109). There are certainly differences in visiting botanists' criteria and, more broadly, ways of knowing the forest—more comparative work seems to be required on swampy inland forests, where local experts appear to make more distinctions. Nonetheless, Indigenous capacities to classify forest types seem like major assets for improving vegetation maps for the Acarai-Corentyne Corridor and surrounding areas of southern Guyana. For example, Indigenous plant experts marking forest type changes along a trail or transect could provide ground-truthing data to improve existing, low-

resolution false color satellite imagery analysis. Detailed attention to changes in forest type, like the earlier description of narrating movement in terms of the forests one passes through, suggests that local Indigenous peoples pay attention to vegetation types across the landscape in a way that outside scientific collaborators would greatly benefit from. Masakeñarî experts had independently reviewed satellite imagery and topographic maps to inform their input on constructing the trail system during the advance work. Even more significantly, the broad correspondence between these results and the plant team's findings suggest that such surveys could be conducted by Indigenous people in their own languages, placing local ecological knowledge at the center of future efforts to gather botanical data and use it for conservation decision-making.

Aquatic systems

In addition to forest types, local experts from all three villages characterized differences between sections of the Essequibo River and between the Essequibo and New River watersheds. Some local experts had direct experience traveling on and fishing at sites along both main rivers, but local ecological knowledge about aquatic systems also included a wider body of stories and observations that were clearly accrued over multiple generations and familiar to Indigenous people who had not personally travelled the entire area. Indigenous insights on the distribution of fish and reptile species across the Acarai-Corentyne Corridor form part of how Indigenous residents of Masakeñarî, Parabara, and Cashew Island pay attention to and share observations about the ecology with each other across this social landscape—they were not merely responses to questions asked by visiting biologists during the rapid inventory. In conversations Oakley facilitated between Masakeñarî experts and the fish team, Masakeñarî experts quickly identified two food fishes common in Guyana's Rupununi region—red-tailed catfish (*Phractocephalus hemioliopterus*; Fig. 7S) and red-bellied piranha (*Pygocentrus nattereri)*—that are not present in Kanashen or near Camps Amuku and Monkey Jump on the Essequibo River, even though they are part of the same watershed. Visiting fish biologists were initially surprised by this locally-described faunal break. As local experts suggested, both fishes were absent from fish team and environmental DNA sampling at Camps Amuku and Monkey Jump. Another readily shared insight was the absence of two reptiles in the upper Essequibo area: black caiman (*Melanosuchus niger*) and yellow-spotted river turtles (*Podocnemis unifilis*), both subjects of ongoing research and conservation efforts to the north. During the discussion, some Masakeñarî experts who had traveled extensively across southern Guyana suggested the faunal break occurs around King William IV Falls—around where the Essequibo River flows off an escarpment at the northern end of the vast plateau that forms most of the Acarai-Corentyne Corridor (see the *Regional panorama* chapter on page 89). That means black caiman and yellow-spotted river turtles occur in the northwestern part of the Acarai-Corentyne Corridor but not near the rapid inventory campsites (Fig. 2A).

Given the long history of Indigenous travel and exchange between the headwaters of the Essequibo River and New and Corentyne Rivers (see the *Social landscape* chapter on page 170), it is perhaps not surprising that local experts also possess robust knowledge of the different fish communities in these watersheds. For Parabara and Masakeñarî experts, the New River is unique for the presence of stingrays and red-tailed catfish, neither of which have been found to occur in the upper Essequibo in Kanashen or near Camps Amuku and Monkey Jump. On a creek in the New River drainage at Camp Monkey Jump, Masakeñarî expert Mark Suse—an elder with extensive knowledge of the forests east of the Essequibo River—quietly warned fellow Masakeñarî expert Seon Johnson, a young man on his first visit to the watershed, to take care with his footing while operating a gill net with the fish team because of potential stingrays. Unsure if their distribution extended so far from the main river, Mark hesitated to make the announcement to the whole group. But while sampling environmental DNA just upriver from Mark and Seon's work with fishes, Parabara expert Onesimus Rudolph spotted a stingray in the shallow water. The fish team quickly regrouped to collect the important specimen (*Potamotrygon boesemani*; Figs. 7A, 11J), crediting the team of local experts for knowing where to look out for the stingray. While Mark had known the possibility, he was surprised to find a full-size stingray in such a narrow creek, suggesting that the direct experiences of the rapid inventory across the two watersheds will add another layer to this dynamic body of local ecological knowledge.

Seasonality and cultural use

Local experts' direct experience with seasonal and year-to-year variations also informs and contextualizes their observations of the landscape. Close attention to seasonality emerged through the ways that experts from Masakeñarî, Parabara, and Cashew Island explained and reflected on their observations of biodiversity and landscape features during the rapid inventory, powerfully demonstrating another way in which local ecological knowledge takes a holistic approach to the forest

ecosystem. For example, local experts did not just observe and identify plant species along the trail system—they often also situated those plants in seasonal reproductive cycles by identifying the time of year when they fruited or flowered, and in some cases what animals ate those fruits or visited those flowers. The human use of resources in a sustainable manner—including fishing, hunting, collecting, and farming—is grounded in similar types of highly-detailed perceptions of seasonality and temporal change. Thus, local experts make an invaluable contribution to understanding how ecological or hydrological features observed in the brief, three-week dry season field window might be normal or anomalous in the context of seasonal and year-to-year variations.

One important type of seasonal change in the Acarai-Corentyne Corridor, and in local perceptions of yearly cycles, is the dramatic difference between rainy and dry seasons (see the *Regional panorama* chapter on page 89). In conversations at the campsites, local experts characterized the region's dry season as lasting from around September to March, peaking in dryness around November before less intense rains begin around December and January. They reported that rainy seasons usually last from April to August, though in recent years there have been locally observed variations in the beginnings and ends of these seasons as well as their intensities. Masakeñarî expert Phillip Suse described the dry season conditions during the rapid inventory as more intense than usual, helping put the research period into context. Local characterizations of rainy and dry seasons, and their year-to-year variation, likely speak to more than strictly monthly average rainfall (Fig.18), with the level of the rivers and creeks—and the associated differences in ecosystem processes that go with them—serving as a more important barometer for local understandings of seasonality and climate change.

In the dry season, the shrinking creek and river systems concentrate food fish in greater densities, which makes hand-line fishing relatively effective, and also exposes powerful rapids on the main rivers. Many terrestrial animals come to the main river for water, shaping the hunting strategies used by Indigenous people from local communities, who reported they themselves tend to stay along the main rivers when waters are low. In the rainy season, the expansive flooded forest provides habitat for fishes to disperse across a much larger area, making them more difficult to catch by hand-line methods. Hunting for primates is prized in this time of year because of the abundance of fruiting trees, which according to Masakeñarî experts peaks in May, that the primates feed and grow fat on. Previous studies of Waiwai hunting suggest that primate hunting by Masakeñarî residents mainly occurs between May and August (Shaffer et al. 2018a). Throughout the dry season, and even at the end of the rainy season, according to Masakeñarî local experts, primates are leaner and less desirable as game meat (see also Shaffer et al. 2018b). Other animals like paca are concentrated on smaller islands created by the flooded forest, making them easier prey. Local experts recounted how they can travel further from the main river in dugout canoes, closer to their swidden agricultural fields as well as upland forest areas. While monthly rainfall climatology (Fig.18) indicates March has higher average rainfall than August, the river levels would usually remain low in March but high in August. It is possible that local experts characterize March as the last month of the dry season and August as the last month of the rainy season because of these seasonal patterns in their subsistence activities, given that we did not ask specifically about rainfall volumes.

Local ecological knowledge of the transformations of ecosystems between rainy and dry seasons emerged most clearly during the rapid inventory through Indigenous practices associated with those times of the year. In particular, we enacted two Indigenous fishing techniques: vine-based poisoning of creeks or rapids (Figs.11D–G), associated with the dry season, and fish trap baskets set in creeks (Fig.11R), associated with the rainy season. Both techniques illustrate, once again, the holistic character of local ecological knowledge, from the use of plant materials to source the poison or assemble the basket to the targeting of desirable food fish in particular creeks and cultural norms around how decisions are made to use these techniques and how the fish catch is distributed. They also exemplify how our attention to local ecological knowledge in the rapid inventory generated exciting dialogue between biological taxonomic groups, as well as between visiting scientists and local experts. Conversations about cultural uses and landscape features led to deeper discussions between local experts and the plant and fish teams, then to local experts leading the preparation and implementation of the two techniques based on their knowledge of where to target to best advance the fish team's data collection, then to discussions and analysis of the fish collected.

Vine-based poisoning is practiced selectively during the dry season in slow-flowing creeks with large food fish like haimara (*Hoplias aimara*) or exposed rapids that are home to abundant red-bellied pacu (*Myleus pacu*; Fig.7Q). The hairari vine (Waiwai: *umawa*, Wapishana: *aishar*, Trio: *ineku*; *Deguelia chrysophylla* cf.) contains rotenone compounds that constrict oxygen flow in fish gills. When the woody stems are

pounded and placed in the water, liquid from the vine mass seeps visibly into the waterway with a white, milky color, and works quickly, stunning both small and large fishes that come to the surface struggling for air. The method is utilized in the dry season when fish are concentrated into shallower, smaller creeks or the flow of river rapids is slower, allowing the poison to work effectively without becoming too diluted or too quickly dispersed. Local experts from all three communities emphasized that the technique is used for communal occasions (e.g., Christmas, Easter, and marriage celebrations) and open to an entire village's participation, suggesting robust cultural processes already exist that shape local decisions and norms about use intensity (see also Yde 1965, 136–140). Other dry season fishing techniques that local experts reported using were hook-and-line fishing (Fig. 11P) and shooting fish with bow-and-arrow in shallow waters during the day or using flashlights to shine for fishes' eyes at night.

On two occasions during the rapid inventory, local experts procured the vine and selected a creek where it could be effectively used in collaboration with the fish team's data collection. Masakeñarî experts Syra Ayaw and Mark Suse led the preparation of the vine and selection of an appropriate slow-flowing creek near Camp Monkey Jump. They cut the vine into sections and pounded it to separate the fibers, which began to release the liquid inside (Figs. 11D, 11G). This rough pulp was swirled upstream of a section of creek they selected because it narrowed, allowing the fish team to position themselves with hand nets and a gill net to capture the fish that floated to the surface over the course of about 30 minutes. While the fish team focused on the unique small fishes they netted, and later an electric eel that had floated from the creek into the main Essequibo River, the local experts' attention shifted to collecting three large haimara at the creek mouth that contributed to the evening's dinner. The technique was repeated at Camp New River with Cashew Island experts led by Tina Kenke (Figs. 11E–F), and the fish team credited local experts' fishing knowledge for the method that produced the most complete and abundant fish sampling of the rapid inventory (see the *Fishes* chapter on page 117), better than their available research gear.

One rainy season fishing technique historically used by Waiwai and other Indigenous peoples along the upper Essequibo River is the fish trap basket (see Yde 1965, 140–142). The Waiwai fish trap basket (*kamina*) can be set overnight to lie in wait for large food fish, spring loaded so that its catch will be suspended in the air when the fisher returns the next morning. It has a conical shape with a wide opening on one end that narrows to a point on the other. By tying fish as bait at the narrow end, predatory fish must swim inside the trap for their meal; their bite triggers the snare, releasing a bent piece of wood and lifting the trap out of the water where—if successful—it suspends the fish jaws-down.

Though it is seldom used today by people in Masakeñarî, Parabara, and Cashew Island, we discussed the Waiwai *kamina* fish trap with Masakeñarî experts while documenting petroglyphs along the Essequibo River from Camp Amuku to Camp Monkey Jump (see the *Social landscape* chapter on page 170). Masakeñarî expert James Suse traced the outline of one petroglyph that he interpreted as a fish trap design, a motif also characterized by Guyanese archeologist Denis Williams (1979a), which inspired the decision to make the basket for fish sampling and food provisioning on the rapid inventory. James had previously constructed the basket and used the fishing technique, which targets haimara, but was busy with the plant team. He spoke with other Masakeñarî experts Syra Ayaw, Mark Suse and Isaiah Ayaw, all of whom had seen the traps made but never themselves plaited the design. Together, the three gathered the appropriate palm tree (Waiwai: *yuřwa*) and vine (Waiwai: *arapapeto*) materials from upland forests near Camp Monkey Jump. Syra and Isaiah plaited two fish traps by cutting long strips of the palm's trunk and binding them into a conical shape with the vine, plaiting from the narrow end outward to the wide opening. Once prepared, Isaiah identified where to set the traps, paddling up Monkey Jump Creek from our camp to select a small pool at a bend in the creek where he had seen haimara activity in the past. As a boy, Isaiah had watched his late father Ayaw set *kamina* fish traps and shared that the trap's opening had to face downstream because haimara hunt from that direction. He cut three approximately 5-m wooden stakes to create the trap's snare, setting two in an 'X' underwater to brace the trap and angling the third above them. He affixed the trap to that third stake, then arched it down into the water, passing the vine string through the bait fish set inside the trap and tying it off so it would wait, spring-loaded, for an haimara to bite through and release the snare (Fig. 11R). The next morning, both traps stood upright with large haimara suspended jaws-down in the baskets. One was so much larger than what the fish team collected with hook and line equipment that they wanted to take a skull specimen; the meat went toward the camp meals.

The making and use of the *kamina* fish trap is a powerful example of how many aspects of local ecological knowledge come together in objects from Indigenous material culture, from the provision of suitable plant materials for construction

to the awareness of fish behavior shown in the design and positioning of the trap. In this instance, the context of the rapid inventory reactivated this set of knowledge practices which for some participants were previously known only through memories or stories of parents' and grandparents' fishing. Such skilled use of the *kamina* fish trap and vine-based poisoning are but two examples of how local ecological knowledge is part of—and shared between generations through—Indigenous subsistence practices that are highly attuned to seasonal transformations. Such knowledge systems likely date back centuries, as fish traps are an important part of petroglyph motifs in southern Guyana and their location potentially connects to productive fishing pools (Williams 1979a).

The value of co-producing biodiversity data

While much of the rapid inventory biological survey data (see previous chapters in this report) focuses on recording the observed species within each taxonomic group studied, Indigenous experts consistently shared in-depth observations of particular species—like their preferred habitats or changes across rainy and dry seasons—and situated them in relation with other species with whom they interact. While at first it may appear obvious that individual organisms interact with other species and with the forest ecology, the holistic character of local ecological knowledge is grounded in an ability to describe and understand a diversity of interactions between species and across biological taxa, and across geographical space and time, which in the rapid inventory enriched the single-taxon, local and present time focus of biologists on the team. Local ecological knowledge of habitats, watersheds, and seasonal transformations, as described previously, highlight the contribution of the participating Indigenous experts in understanding dynamics that are not possible to otherwise document in a rapid inventory, surveying discrete trail systems in one three-week period of the year. At the species level, local ecological knowledge of the connections between species—what we refer to as multispecies relations, and which can include human beings—allows experts from Masakeñarî, Parabara, and Cashew Island to interpret small changes in things like animal behaviors or fruiting patterns and immediately know their potential chains of effects within the forest ecology. Multispecies relations are even the basis for some Indigenous place and species names, as in the case of the plant *pakuci nahrî* (*Ludwigia* genus), literally meaning 'red pacu food' in Waiwai, whose seasonal fruits are popular when they drop into the river—effectively mimicked by fishermen who cast their rods along the bank with the same fruit as bait. For Indigenous people living near the Acarai-Corentyne Corridor, such detailed knowledge of multispecies relations evidences generations of close observational attention to forests and forest beings.

Two descriptions of such chains of multispecies relations help illustrate the holistic character of local ecological knowledge, by which we mean the consistent way that local experts characterize any one species in its relations with other parts of the forest. First, for local experts, to know upland forest in the rainy season is to know the fruiting of the *Ficus trigona* (Waiwai: *urukupu*) and acoustic register of the red-faced black spider monkey (Waiwai: *poroto*; *Ateles paniscus*; Fig.10K) who feeds on them. Likewise, to know black spider monkeys is to follow their seasonal cycles of nourishment, when they are sought-after game animals, and thinness, feeling for their hunger in the dry season or when abnormal rains disrupt the fruiting times of their favored food sources. Local experts also draw from this multispecies knowledge while hunting, as they walk to the upland forests that they know to be red-faced black spider monkeys' preferred foraging grounds in the rainy season and attract their prey through whistled calls that draw these canopy foragers in from surrounding hilltops. At the same time, local experts know that other game animals often follow foraging black spider monkeys, like the red brocket deer (*Mazama americana*; Fig.10EE) eating dropped or knocked-down fruits from the forest floor. Aspects of these multispecies relations are encoded in place: one site near King Edward Falls on the New River is known as Meekuimo, or 'Big Monkey Place,' for the exceptional abundance of black spider monkeys that have been heard on that rocky hillside.

Second, local experts sometimes answer the piercing call of the black caracara (*Daptrius ater*) falcon by imitating the whistle of the tapir (*Tapirus terrestris*). In response, the falcon circles closer toward the sound of a tapir, continuing its cry but finding only a traveling group of people along the river. Local experts intimately know this interspecies form of communication based on close observation of a symbiotic relationship between tapirs and black caracaras, in which the falcons eat ticks from the skin of tapirs. Masakeñarî expert Kwang Suse described how the bird and tapir call out in order to locate each other in the forest based on his experience of once coming across a tapir rolling on the ground as a black caracara expertly extracted the numerous large ticks on its body, and even from its ears. Waiwai people intervene in this communicative process, sometimes playfully and sometimes in search of a prized game animal. When traveling the river,

casually making the tapir whistle response lures the black caracara from its flight to circle the boat, a source of mild amusement that usually goes undiscussed but nonetheless demonstrates close knowledge of webs of relations between forest species. While hunting, the falcon's cry presents a different type of opportunity: stay quiet, follow the hawk, listen for the tapir's whistle, and potentially find your prey. Another account of similar black caracara-tapir interactions in the Brazilian Amazon notes that experienced Kayapó hunters described the role of vocalization in the two animals' ability to locate each other, suggesting a potential cleaning mutualism that the biologist would not have been aware of based solely on their own observations (Peres 1996).

Taken together, these brief examples provide an initial sense of how local ecological knowledge deepens the observational attention and ecological understanding possible within a rapid biodiversity survey. Such local expertise in situating individual species in their ecologies and webs of multispecies relations also added significantly to biological data collection through specimen collection and field observations. The Indigenous fishing method using the hairari vine contributed to approximately 40% of the individual specimens collected by the fish team during the rapid inventory, and represented the overwhelming majority of fish specimens from the New River watershed—of particular scientific significance because of the understudied nature of the basin's fish diversity. Further, on multiple occasions when the fish team asked about fishes that were expected in the area, or sighted but not sampled, local experts came back with the fish in question. As examples, Masakeñarî experts quickly procured a fish they call *kunurima* (*Chalceus macrolepidotus*) from near the falls that bears the same name locally, and Cashew Island experts successfully returned with red-tailed catfish and stingray after questions from the fish team, two species described previously in this chapter for uniquely occurring near Camp New River but not Camp Amuku or the Essequibo portion of Camp Monkey Jump. Such sampling success indicates that they know a great deal about where that species lives at that time of the year, plus what and how it eats. Masakeñarî expert Phillip Suse made the sole observation of the white-faced saki, and local experts often made more mammal observations than visiting biologists while walking the same trails, possibly by using calls to draw the animals into viewing range.

Local ecological knowledge also shaped the research team's ability to think comparatively across the Acarai-Corentyne Corridor and surrounding areas. With their holistic approach, local experts were especially attentive to variations in the multispecies dynamics of the trail systems where we worked, some of which were located in areas they had not previously visited. For the fish team, haimara specimens from Camp New River were exceptionally large, and larger compared to Camps Amuku and Monkey Jump, but Cashew Island experts described them as normal for the New River. Parabara expert Onesimus Rudolph grabbed for a spiked fish during the vine poisoning at Camp New River, and despite the pain he held it tightly, knowing it was a fish he had never seen before. Cashew Island expert Tikkil Kenke confirmed that it was rare to find around that area. In discussions between the plant team and local experts, it became clear that Indigenous communities highly valued connecting Linnaean names with their Indigenous language names as a strategy to convey their knowledge to other Guyanese. Since most forestry research in Guyana takes place far to the north, where the plant composition is much different (see the *Vegetation* chapter on page 109), knowing the Linnaean names is an important way for local people to explain their unique tree species. Dialogues with the rapid inventory team also point toward areas for further inquiry and opportunities for collaboration.

Despite these clear benefits, the main priority of the biological inventory to document observed species remains in tension, to a degree, with the emphasis local ecological knowledge places on holistic understandings of multispecies relations. Dialogues between local experts and visiting biologists often seemed to go deeper into the dynamics of a particular species of mutual interest, a luxury that is difficult to accommodate given the inventory's time constraints and prevailing biological research goal to build as extensive of a list of what is present in the area as possible. For example, Cashew Island experts were knowledgeable about the ecology of the aquatic frog *Pipa pipa*, which they sometimes use as a bait while fishing, and very interested in the herpetologists' characterization of how the frog attracts its own prey. But, for the herpetologists, *Pipa pipa*'s aquatic ecology was not representative of frog diversity in general, and thus just a small part of their field work. The bird team faced a similar dynamic, in which the potential to discuss cultural interactions with birds was largely separate from the priority of species identification during walks on the trail system. Yet that presented its own opportunities for knowledge exchange, like when Masakeñarî expert Kwang Suse asked ornithologist Cameron Rutt about the especially noisy Cinereous Antshrike (*Thamnomanes caesius*). Kwang quickly recognized Cameron's characterization that the antshrike was the 'leader' of mixed-

species flocks, and subsequently used that call as a cue to wait for—or call—the flock. Some further opportunities for connecting local ecological knowledge and biological taxonomic research include questions of abundance, particularly for mammals and plants, and seasonal cycles, like those of fish migration and spawning patterns, which are difficult to evaluate in a point-in-time survey.

DISCUSSION

The extent and depth of local ecological knowledge with which Masakeñarî, Parabara, and Cashew Island experts engage with the Acarai-Corentyne Corridor is a crucial asset for this landscape's conservation future. This section briefly identifies potential contributions that local communities make, based on the rapid inventory results, to effective and equitable conservation that is globally-recognized. The International Union for the Conservation of Nature (IUCN) Green List of Protected and Conserved Areas Standard proposes three baseline components for "achieving successful conservation outcomes through effective and equitable governance and management:" 1) Good governance, 2) Sound design and planning, and 3) Effective management (IUCN and WCPA 2017, 6). Each baseline component has multiple criteria, and together these support achievement of a fourth component—Successful conservation outcomes—which includes conservation of major natural values, ecosystem services, and cultural values. Local ecological knowledge of the Acarai-Corentyne Corridor is a significant asset for achieving criteria within each of the three baseline components, as described below, and lies at the center of conserving the rich cultural value of the area within the Green List Standard framework. Brief consideration is also given here to additional steps that would be significant and necessary for conservation action in the Acarai-Corentyne Corridor to meet this global standard.

Local experts from nearby Indigenous communities can contribute greatly to effectively monitoring the Corridor's vast and remote landscape. The robust local ecological knowledge documented here suggests the Acarai-Corentyne Corridor is a prime candidate for further connecting scientific and local knowledge in conservation decision-making, contributing to planning and management based on multiple knowledge sources to support governance vitality and adaptive management (see Standard 1.3). Existing Indigenous norms for making sustainable decisions about resource use are an asset for conservation governance arrangements that are both legitimate and effective (see Standard 1.1). Community members' extensive direct experience in the area, and substantial contribution to characterizing its biodiversity during the rapid inventory, indicate their important potential role in collaboratively defining the site's major biological values for conservation (see Standard 2.1). The holistic character of local ecological knowledge contributes massively to understanding threats and challenges to biodiversity in order to implement sound design and planning (see Standard 2.3). While the rapid inventory identified biological value at three campsites, and it is possible to extrapolate with modeling or aerial imagery, local Indigenous peoples can quickly notice minor variations in forest and aquatic ecologies—such as contaminated waters or changes in mammal abundance—that may indicate the need for planning and management responses. For effective management, experts from local Indigenous communities are perhaps best positioned to lead patrol and surveillance systems on the ground (see Standard 3.5), with potentially substantial cost savings versus similar efforts by rangers based far away in regional or national offices that support the financial sustainability of the area (see Standard 3.1). Local ecological knowledge can even be combined with novel technologies and tools like environmental DNA (see the *eDNA* chapter on page 151) to make on-the-ground patrols maximally effective.

Perhaps most importantly, the successful conservation of the area's cultural values (see Standard 4.3) will depend on the commitment and collaboration of local experts, and the ethnoecology results presented here offer a glimpse into the rich cultural significance of these forests. Yet there remain other aspects of the Acarai-Corentyne Corridor's conservation future where greater engagement with local Indigenous communities is needed, beyond the scope of the local ecological knowledge research conducted during the rapid inventory. Aspects of the IUCN Green List Standard that merit further effort in pursuit of an equitable conservation future in this landscape include: appropriate opportunities for stakeholders to participate in governance and governance that recognizes the legal rights of Indigenous peoples (see Standard 1.1); consideration of the social and economic context in design and planning (see Standard 2.4); as well as providing benefits to local communities and striving to accommodate the needs of users (see Standard 3.3). The collaborative approach with residents of Masakeñarî, Parabara, and Cashew Island in the rapid inventory hopefully provides a foundation for further engagement between the government of Guyana and local communities along these and other lines.

CONCLUSION

Local experts' observations of forest habitats, seasonal transformations, and multispecies relations of the Acarai-Corentyne Corridor reveal a rich system of Indigenous ecological knowledge at the center of ongoing ways that nearby communities relate to this important forest landscape. Such knowledge represents an important cultural asset for human well-being in these communities, one that is actively being shared and strengthened whether through ecologically-attuned practices like vine-based fish harvesting and sophisticated hunting techniques, spoken Indigenous languages with detailed vocabularies for forest types, or new dialogues about the region's flora and fauna with visiting biologists. Supporting the continued vitality of local ecological knowledge maintains the most detailed body of observations and sustainable use practices for the unique biodiversity value of the Acarai-Corentyne Corridor, an incredible resource for conservation action. That will require continued access to and use of culturally significant places, plants, and animals. It also creates unique opportunities for leading roles for Indigenous people in adaptive management, community-based monitoring, and collaborative approaches bridging scientific and local knowledge systems that could both strengthen local ecological knowledge and sustainable use practices for future generations and set a global model for effective and equitable conservation.

SOCIAL LANDSCAPE

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Conservation targets: Detailed landscape knowledge, which Indigenous communities possess and pass on while moving along the region's rivers and trails; recognition of the cultural value of the Acarai-Corentyne Corridor as a crucial zone of connectivity between Waiwai, Wapishana, Trio, Macushi, and other Indigenous peoples; strong place-based knowledge and mobility practices, which are integral for future zoning or management schemes; high-quality, well-preserved, and thoroughly documented historical and cultural resources, with special emphasis on the Indigenous cultural heritage represented by petroglyphs and other archaeological points of interest

INTRODUCTION

The history of Indigenous mobility and settlement patterns in southern Guyana is crucial for understanding how contemporary communities come to know, access, and move through the Acarai-Corentyne Corridor. This chapter reviews ethnographic, historical, geographical, and archaeological evidence to present a picture of the Corridor as a deeply social landscape: as a place with a lengthy human history, a landscape that Indigenous people know intimately well, and a region that connects people as they travel great distances to visit one another. When seen through the eyes of Indigenous experts, the vast forests of the Acarai-Corentyne Corridor come alive with stories and significance: former villages, hunting grounds, and forest routes are recognized and remain vital in a living memory of movement and use.

Indigenous knowledge of landscape, which is based on shared cultural history and practices of mobility associated with subsistence and social activities, should be considered an important asset in future land-use decisions. Communities able to move so knowledgeably through the region are precisely those who are best suited to help protect and preserve it. What follows here is a brief summary of the collaborative methods we used to document landscape and mobility in the Acarai-Corentyne Corridor, followed by a discussion of community formation, Indigenous patterns of movement in the region, and evidence of the deep human history that local experts recognize therein. Sites important for human activities and history are displayed on maps that accompany this chapter (Figs. 46–48).

Today, four Indigenous communities in Guyana live near the Acarai-Corentyne Corridor: two in the southwest, one in the northeast, and one in the northwest. Masakeñarî, a Waiwai village on the Essequibo River to the southwest, manages its legally titled Amerindian lands as the Kanashen Amerindian Protected Area, the only Indigenous-managed area in Guyana's National Protected Area System. Parabara, a Wapishana and Waiwai village on the Kuyuwini River, is—as of May 2025—slated to receive legal land title imminently (Department of Public Information 2025), though it is not yet clear if the grant would be their full proposal for the area directly west of the Essequibo between the Kuyuwini and Kassikaityu Rivers or a smaller portion. Both the northeastern Masakeñarî land title boundary and the eastern Parabara proposed boundary directly abut the Acarai-Corentyne Corridor. Cashew Island (Kasuela), a Waiwai and Trio village located on the New River near its confluence with the Corentyne, currently has neither legal land title nor a submitted application for land title. Located on an island in the New River, Cashew Island village itself is directly on the northeastern boundary of the Acarai-Corentyne Corridor. While it meets the requirement for more than 25 years of land tenure, the village population is below the

150 residents stipulated for land title eligibility under the Amerindian Act (2006). Apoteri, a Makushi and Wapishana village at the confluence of the Rupununi and Essequibo rivers, holds legal land title to an immediate area around the community and a potential land extension interest in forests between its current title and the northwest boundary of the Acarai-Corentyne Corridor.

A number of other Indigenous communities live in the greater area of the Acarai-Corentyne Corridor. Wapishana communities in the South Rupununi, including Shea, Maruranau, Awarewaunau, and Aishalton, have histories of access to the Essequibo River (SRDC 2012). Other Makushi communities in the North Rupununi, like Rewa and Crash Water, have connections to the area near the confluence of the Rupununi and Essequibo rivers (Simon 2007). On the east bank of the Corentyne River, in Suriname, the Trio communities of Lucie and Amotopo live immediately outside of the government of Guyana's expanded area of conservation interest, with the Trio community of Kuruni a short distance farther away (Mans 2012).

METHODS

Documentation of landscape features was carried out at each campsite visited during the rapid inventory (see the *Regional panorama* chapter on page 89) alongside the local ecological knowledge research described elsewhere and with the same participation of local experts from Masakeñarî, Parabara, and Cashew Island (see the *Local ecological knowledge* chapter on page 159). The team worked to document landscape features identified by local experts as ecologically or culturally significant, complementing the efforts of Western-trained biologists to identify features with high conservation value. Information about landscape features was generated through ethnographic interviews while walking trails or traversing waterways (Figs.12A–B); collaborative mapping of landscape features, including historical and culturally significant sites (Figs.12K–L); interviews about the history of human transit through the study area, including site visits to places of observed or potential past human use (Figs.12C–J); and mapping of seasonal dynamics, use of the study landscape, and ecological relations between important species.
Prior to fieldwork, the team also reviewed the historical, anthropological, and archaeological literature on the Indigenous peoples and forest landscape of southern Guyana, which provided both contexts and gaps in which to situate our work. For better or worse, the colonial accounts of European and North American expeditions like Schomburgk (see Rivière 2006), Barrington Brown (1876), and Farabee (1924) provide important information on the social landscapes of both the upper Essequibo River and New River in the late 19th and early 20th centuries.

In participatory mapping exercises, Campbell, Yamochi, and Oakley used large-format printed maps based on government cartography and satellite data sources to facilitate discussions with local experts. These conversations yielded annotations on the map, in addition to a list of places slated for visiting. After field visits and interviews, further annotations and syntheses were placed on camp-based maps and larger-scale maps of the entire rapid inventory study area. In this way the team came to appreciate the dynamic connections between individual sites within a broader circuit of movement and seasonal change that typifies the corridor and its environs. However, during fieldwork we did not focus on the northward extension area of the Acarai-Corentyne Corridor (see pages 18–19), and thus these results do not fully reflect local experts' knowledge of the approximately ~100-km stretch of the Corentyne downstream from Cashew Island.

Over 16 days of fieldwork, including the travel day between Camps Amuku and Monkey Jump, we worked with 10 different local experts to conduct six participatory mapping sessions (two per camp) and traveled over 200 km along the Essequibo and New rivers mapping important sites and features. Terrestrial routes were also walked and mapped, allowing us to document over 100 km of trails in the region. While on the move, team members photographed and took GPS coordinates for sites that had been flagged as important, in addition to any other sites that featured some evidence of human history (e.g., archaeological materials or plant species important for human use). During field visits, hikes, and canoe journeys, team members utilized a data collection app hosted on the ArcGIS Survey123 platform to collect nearly 700 unique points of interest. As each of these data points was geotagged, and was often accompanied by photos, recorded audio, and other pertinent information, the team was able to cross-reference collected data using digital maps and other visualization applications. Landscape and mobility data were coded for relevance to ecological dynamics (e.g., seasonality); physical features and their uses; historical occupation; and socially-relevant locations (e.g., named locations or storied sites). Due to sampling limitations, these data are limited to the environs of campsites and the amount of ground (or water) we could cover in a few days of fieldwork. However, the data reveal patterns of mobility and connectivity that allow us to extrapolate more broadly about the social features of the Acarai-Corentyne Corridor.

RESULTS

During the rapid inventory, we visited 12 historic sites (e.g., old farms or villages), mapped current or former trails used for hunting, collecting, or regional travel, and documented 40 petroglyphs, 57 grinding surfaces, and hundreds of occurrences of plants useful to humans. We also recorded the local names (in Waiwai, Wapishana, and Trio) for dozens of landscape features, including rivers, mountains, swamps, and waterfalls, filling an important gap in the geographic knowledge of the region. Taken together, this evidence reveals a compelling and unique social landscape. Of particular importance, we highlight how well-traveled routes through the Acarai-Corentyne Corridor connect people to places, how local place names encode culturally-specific knowledge, and how contemporary Indigenous people curate knowledge of historic and archaeological patrimony in the region.

Community histories

Strong personal, family, and exchange relations connect people in Masakeñarî, Parabara, and Cashew Island with each other. Many residents used to live together on the upper Essequibo River at Akîtho, a previous settlement close to Gunns Strip (see Mentore 2005). In 2000, after heavy flooding at Akîtho, some residents relocated upriver to Masakeñarî while a smaller group moved to Parabara, closer to Wapishana villages in the South Rupununi where some had close family (Alemán 2005; Mentore 2010; Oakley 2019). More than a decade earlier, in the mid 1980s, the extended family of Kenke Yaimo relocated from the upper Essequibo River to Cashew Island, where he remains the village leader (toshao). For years prior, Kenke and his family had made the month-long journey from the upper Essequibo to the upper Corentyne, visiting and exchanging with their Trio relatives in southern Suriname. In addition to Cashew Island's value connecting social networks in southern Guyana and southern Suriname, they were encouraged to settle there by officials in the Guyana Defence Force, who offered income-earning opportunities supporting the military base at Camp Jaguar. While Masakeñarî obtained land title in 2004, with support from Conservation International-Guyana to advance a vision for a community-owned conservation area (Stone et al. 2010; Oakley 2020), Parabara's lack of legal title left areas near their village vulnerable to gold mining incursions, especially intense in 2010 (Mentore 2020). Cashew Island receives some support from the Guyana Defence Force, including a primary school established in 2014 (Stabroek News 2014), and villagers work as guides on army patrols along the New River or as support staff for Camp Jaguar.

Colonial transformations, including the transmission of diseases like influenza, threats of and actual violence, and missionization, shaped Indigenous residence and movement in this area in the 19th and 20th centuries (and likely earlier). Indigenous Taruma people inhabited places along the main Essequibo River from at least the early 18th century (Evans and Meggers 1960), but in the early 20th century disease and other conflict heavily impacted the Taruma population (see Butt Colson and Morton 1982) and remaining residents were incorporated into other neighboring Indigenous communities, including Wapishana villages to the north. Indigenous Waiwai people historically inhabited the uppermost stretches of the Essequibo River further south as well as adjacent areas on the Brazilian side of the Acarai Mountains, documented in the colonial record as early as the 1720s by Dutch traders and in the 1830s by explorer R. H. Schomburgk (Howard 2001, 6). To the north, in Guyana's Rupununi, from the late 19th century onward Wapishana and Makushi labor and settlement patterns were shaped by Catholic missionization (Bridges 1985) and colonization organized around the cattle and balata economies (Henfrey 2002, 65–68; MacDonald 2014) that encouraged residence in larger villages associated with churches or ranches. Latex extraction from balata trees (*Manilkara bidentata*) was particularly important to the establishment of Apoteri village as a key site for production.

In the mid-20th century different Indigenous peoples inhabiting the forested borderlands between Guyana, Brazil, and Suriname congregated around two related mission stations, one on the upper Essequibo River in Guyana and the other on the Sipaliwini River in Suriname. In the late 1940s, United States-based evangelical Christian missionaries established a station on the upper Essequibo River which they named Kanashen, in what today is the Kanashen Amerindian Protected Area. Whereas Indigenous peoples' distribution across a wider territory had previously been a strategy to evade the harshest impacts of colonial processes, in the following two decades, a number of Indigenous groups inhabiting forests south of the Acarai Mountains—including Waiwai, Mawayena, Xerew, Hixkaryana, and Katwena—moved to live in a cluster of villages around Kanashen (see Schuler Zea 2018; Valentino 2019). Evangelization processes built on the longer-standing regional Indigenous networks, and residents at Kanashen came to characterize their collective identity to outsiders as Waiwai (Howard 2001). In 1960, one of the Kanashen missionaries left for southern Suriname and established the mission station Alalapadu, near present-day Kwamalasamutu on the Sipaliwini River, which once again

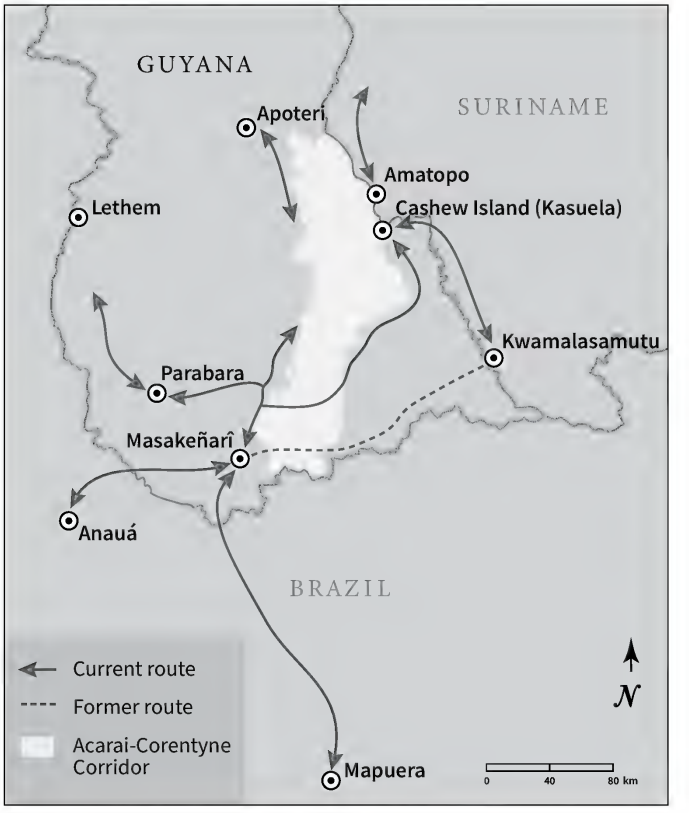
drew together different Indigenous groups—including Mawayena, Okomoyana, Sakëta, and Aramayana—who came to be identified by outsiders as Trio (Mans 2012, 141; see also Rivière 1969).

Both missionization processes were facilitated by then-British Guiana and Suriname's priorities to build greater colonial presence and control on their frontiers, yet they also activated and reshaped existing Indigenous marriage, trade, and movement relations. From the 1970s onward, many of the Indigenous peoples who relocated to live near the mission stations at Kanashen, in southern Guyana, and Alalapadu, in southern Suriname, began to return to the places of their or their parents' birth. In the 1970s, the overwhelming majority of people at Kanashen left for Brazil's Mapuera and Anauá rivers, as did the American missionaries (see Howard 2001; Valentino 2019). In the 1990s, some residents of Kwamalasamutu started to leave to establish other villages on the Corentyne, including Okomoyana-identifying families who sought to return to their ancestral territory near the confluence of the Lucie and Corentyne rivers (Mans 2012, 119–21). Recent archeology suggests that almost all of these recently established villages along the Corentyne are located on historical habitation sites, corresponding to Indigenous accounts of return following the mission period. One Cashew Island expert with family ties to the Okomoyana recalled his mother-in-law's stories of living up the New River until intense drought forced them to move to the Corentyne, which based on this oral history would have been sometime in the early-to-mid-20th century. To our knowledge, this is the first documentation of the human habitation history of the New River above its mouth, and an important part of the archeological research discussed below.

Indigenous connectivity

Indigenous ties across this vast area of southern Guyana, and reaching even further into neighboring parts of southern Suriname and northern Brazil, stitch together a rich social fabric that stretches back generations. The Acarai-Corentyne Corridor lies at the heart of a networked landscape that includes nearly a dozen Indigenous villages connected by well-known trails, creeks, and rivers along routes steeped in cultural and historical significance. During the rapid inventory, local experts from Masekañarî, Parabara, and Cashew Island described how they navigate a vast system of transit routes that link these communities in southern Guyana with Wapishana villages as well as the town of Lethem in Guyana's Rupununi, to Waiwai villages like Anauá and

Figure 46. Indigenous movement routes along rivers and trails in the broader region surrounding the Acarai-Corentyne Corridor, documented during the rapid inventory through interviews and participatory mapping activities.



Mapuera in Brazil, and Trio villages like Amatopo and Kwamalasamutu in Suriname (Fig. 46).

These contemporary routes on the rivers and trails of the Acarai-Corentyne Corridor build on geographically far-flung connections between Indigenous peoples in the region throughout the colonial period, and likely even earlier. Cassava grater boards, hunting dogs, and other goods from Waiwai people on the upper Essequibo River were traded with Taruma and then Wapishana people in the South Rupununi (Brown 1876, 248–249), and Waiwai graters circulated even farther afield to northwestern Guyana's upper Mazaruni (Butt Colson 1973). Movement and exchange across the Acarai Mountains remained strong along separate routes to Waiwai villages on the Anauá River, in the Brazilian state of Roraima, and the Mapuera River, in the Brazilian state of Pará, each of which had their own trade routes with neighboring groups in Brazil. Trade and travel between Waiwai and Trio peoples on the Essequibo and Corentyne rivers, respectively, were documented more than 140 years ago (im Thurn 1883, 272), and as of the 1970s Trio people arrived each September from Suriname, via the New River, to a landing on the Essequibo to trade with the

Waiwai (Williams 1979a, 128). Parrots and hunting dogs from Waiwai villages were exchanged with manufactured goods that Trio people obtained from Surinamese Maroons living to their north (Howard 2001, 228).

Participatory mapping with Masakeñarî, Parabara, and Cashew Island experts documented a detailed understanding of contemporary routes as well as the living history of these trade networks (Fig. 46). River-based travel via dugout canoe or, to a far lesser extent, aluminum boat is the preferred mode of transportation, leading to speedier routes that appear more circuitous than a direct path through forest. Typically, travel between Parabara and Masakeñarî will take two to four days with an outboard engine (and easily more with delays), either following the Kuyuwini and Essequibo rivers or utilizing the Kassikaityu and Essequibo rivers plus a rugged road between Parabara and a landing on the Kassikaityu. These routes are used frequently by Masakeñarî residents as it is their main connection to the Rupununi, where people purchase manufactured goods and foodstuffs in Lethem or Boa Vista, send their children to secondary school, and access other essential services like healthcare. A journey from Masakeñarî to Mapuera will take at least 10 days, with two boat journeys split by a three to four day hike through the forest. Visits between Masakeñarî and Anauá require at least six days of boating and hiking. Travelers from Kwamalasamutu to Cashew Island will spend three days in boats along the Sipaliwini and Corentyne rivers. If they are heading on from Cashew Island to Masekeñarî they will spend another three days ascending the New River, one day hiking over to the Essequibo River, and finally an additional boat day to the village. Cashew Island experts also travel by boat down the Corentyne nearly to its mouth on their way to Georgetown, stopping at a series of Trio villages and other settlements along the way, as an alternative to the Guyana Defence Force flights that they otherwise rely on. Other researchers have documented routes from Apoteri village partway up the Essequibo River, such as fishing trips (Simon 2007), and connections across the Sipaliwini savannas between Kwamalasamutu and nearby Indigenous villages in Brazil's Tumucumaque Indigenous Park (Mans 2012, 23).

The routes between Masakeñarî and Cashew Island or Kwamalasamutu represent the main travel *through* the Acarai-Corentyne Corridor itself, in addition to the significant use of the main rivers that form its western and eastern boundaries. The earliest route known to both Masakeñarî and Cashew Island experts was a former forest trail between the Essequibo River near Gunns Strip and the Corentyne River near the mouth of the Sipaliwini. Though none had themselves walked it, multiple people knew the general route from stories of the journey that their parents had told. The arduous, one-month walk passed between the Amuku and Acarai mountains and crossed multiple rivers near their headwaters in southern Guyana. Later, the preferred route used the same walking trail between the Amuku and Acarai mountains, but followed the New and Corentyne rivers by boat, paddling for multiple weeks to reach Kwamalasamutu (see Berrangé and Johnson 1972, 45). It was this route that Cashew Island Toshao Kenke Yaimo and his family travelled regularly—as much as every three months—between the former Waiwai village of Akîtho, near Masakeñarî, and Kwamalasamutu prior to their move to Cashew Island. According to Masakeñarî experts, an alternative trail between the New and Essequibo rivers was first cut in 1985 when the late Yaymochi (co-author Yamochi's grandfather) returned from Kwamalasamutu up Xapika Creek (Saturday River), a western tributary of the New River. In the following years, different Masakeñarî and Parabara residents had cut trails between Xapika Creek and the Essequibo River, eventually finding two preferred options for the rainy and dry season from a landing on Monkey Jump Creek near Camp Monkey Jump.

The ability to successfully move over vast distances in this region requires patience, skill, and a deep understanding of the seasonal differences in water levels and trail conditions (Figs. 12A–B). Conditions vary dramatically between the rainy season (April–August) and the dry season (September–March). Rainy season obstacles include swollen creeks and inundated forest footpaths or roads, while the dry season presents treacherous rapids and some impassable stretches along rivers. Seasoned and experienced boat captains and bowmen are required for successful journeys, and safely traversing rapids in the dry season often requires such coordination and physical strength that groups will travel together and discuss the best line. Parties rest at well-known camping sites, stop to fish at productive pools along the main rivers, and sometimes hunt opportunistically. Many of these places are named and sometimes linked with former farm or village sites inhabited in living memory, as discussed in detail in the next section.

Kinship, communication, and visiting between Masakeñarî, Parabara, and Cashew Island, as well as with Trio villages in Suriname and Waiwai villages in Brazil, remain strong today. In addition to family ties and regular messages via Internet or transistor radio, transnational networks continue through seasonal celebrations like Christmas and events like soccer tournaments that continue inter-village visiting practices that

are centuries deep. Travel between the Masakeñarî and Cashew Island communities seems to occur at least annually, whether for visits to siblings, parents, and children, or in the course of providing support to army patrols between Camp Jaguar and Gunns Strip. Trips between Masakeñarî and Parabara are much more frequent, as it is the sole access option for Masakeñarî residents traveling to regional services and markets in the Rupununi, given the locally prohibitive expense of charter aircrafts. Thus Indigenous access to and travel through the Acarai-Corentyne Corridor remains a vital part of social life, despite the great distances and remoteness between communities.

Important places

Indigenous names for sites in the Acarai-Corentyne Corridor demonstrate local people's connections not just across the corridor or along its boundaries, but to specific culturally significant places that populate this thoroughly social landscape. During travel for the rapid inventory field work as well as participatory mapping at each camp, we found that Indigenous place names convey local communities' robust environmental knowledge, such as associating plant or animal species with a given locale, as well as stories of significant events from the past that took place there. For example, the name for Kunurima Falls on the Essequibo means 'Red-tailed Fish' Falls, referring to *Chalceus macrolepidotus*, an important food and bait fish associated with the area. Other names refer to where important fruit or nut trees are found, like Katurima Mountain, the easternmost peak of the Amuku Mountains, where fruit-bearing trees popular with monkeys are plentiful or Tîtko Pool, meaning 'Brazil nut' pool, upriver from Cashew Island on the New River. It is also important to note that nearly all of the available maps for southeastern Guyana feature inaccurate locations and even inconsistent names for geographic features, no doubt a function of the fact that few outsiders have traveled in the region. Many, if not most, of the names on 'official' maps are different from those used by Indigenous residents of the area.

Place names that reference past events help transmit cultural knowledge, from anecdotes that are the source of laughter to weightier memories of social history shared from one generation to the next. Xapika Creek (Saturday River), described in the previous section for its place in the current route between Masakeñarî and Cashew Island, recalls the first traveler's lost hat (Waiwai: *xapika*), which was found by subsequent users of the newly-opened trail. The area known in Waiwai as Yawanapi—encompassing a creek, rapids, and a previous farm and habitation site on the Essequibo River—was the ground where a historical alliance between Taruma and Waiwai communities turned sour in the early 20th century, eventually resulting in violent conflict and the incorporation of Taruma into other Indigenous communities. While this general story was already well known to Masakeñarî experts, when our team stopped at the site in transit between Camps Amuku and Monkey Jump, one elder narrated a longer and more detailed version that some Waiwai team members had never heard. For them, physically accessing the site, having never previously disembarked at Yawanapi, was important to learning more of their own cultural history. These stories also include place-based interactions with non-Indigenous outsiders. For example, Cashew Island residents often pass 'Airstrip Island,' located in the middle of the New River, where it is said the Dutch and Surinamese operated a small airfield prior to 1969.

While we encountered significant places for Masakeñarî, Parabara, and Cashew Island experts practically everywhere we traveled during the rapid inventory (Figs. 47–48), this research is by no means a comprehensive or anywhere close to complete picture of Indigenous interactions with the Acarai-Corentyne Corridor landscape. The design of the biodiversity survey focused on characterizing the flora and fauna of these forests, albeit with the important strengths of collaboration with Indigenous experts (see the *Local ecological knowledge* chapter on page 159) and understanding locally significant features of landscape. No research took place in Indigenous community lands, and our methodology did not include resource mapping. With that substantial caveat, the fact of Indigenous resource use in some parts of the Acarai-Corentyne Corridor was obvious to the rapid inventory team and further research with local communities will be important to future conservation action. Cashew Island residents utilize areas along the New and Corentyne rivers for their subsistence purposes, including along the western bank where there are trails for hunting and gathering forest materials. It seems clear that if and when the village seeks legal land title it would include some forests inside the conservation area of interest in its application. The Essequibo between the Kuyuwini and Kassikaityu rivers is deeply known by Masakeñarî and Parabara experts, and traveled frequently by Masakeñarî experts who use it as a primary route to the Rupununi as well as for relatively limited hunting, fishing, and procuring forest materials. According to the Masakeñarî experts, Waiwai people historically traveled as far down the Essequibo as Great Falls, where in the past there were annual fishing trips

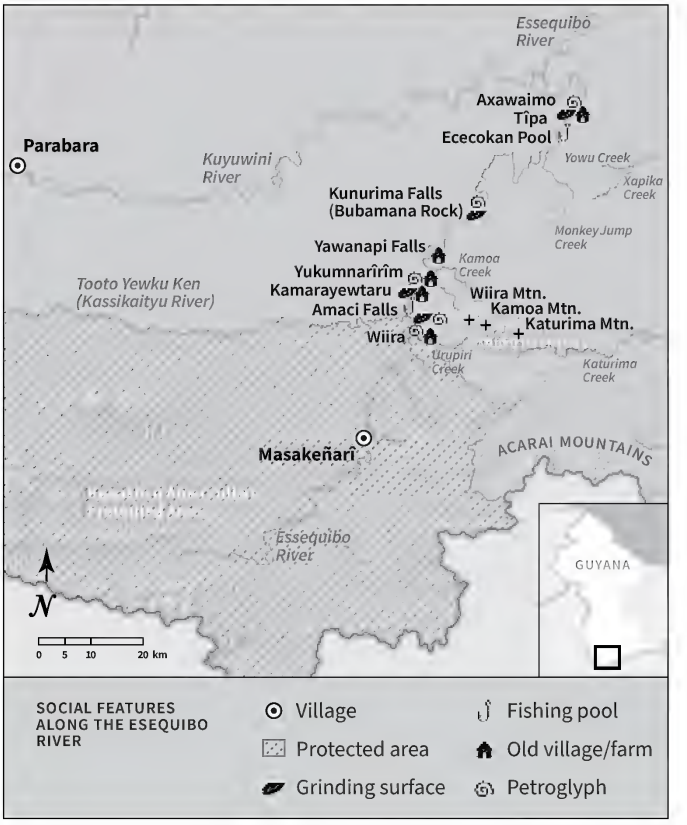
for red pacu, but rarely farther. From the north, Indigenous communities like Apoteri, Rewa, and Crash Water have some ongoing access upriver on the Essequibo (Simon 2007), but no residents of those communities participated in the rapid inventory nor did we visit that area of the Acarai-Corentyne Corridor.

Deep history: Towards an archaeology of the Acarai-Corentyne Corridor

Though the region is less well understood than other areas of the Guiana Shield, archaeological evidence suggests that Indigenous populations have moved through and created settlements in the wider southern Guyana region since at least 5,000 years ago. By taking a collaborative approach to understand landscape features known by local experts, our study noted historical village and farm sites known through oral history as well as petroglyphs (Figs. 12C–F) and grinding surfaces (smoothed or grooved areas in stone slabs or outcrops used for manufacturing or sharpening stone tools; Figs. 12H–J) that are older than living memory. During the rapid inventory, our team documented abundant evidence of human habitation and resource use in the areas where we traveled: along the upper Essequibo River near Camps Amuku and Monkey Jump and along the New River between Camp New River and King Edward Falls. Significantly, the rapid inventory team also documented 18 petroglyphs and 31 grinding surfaces that were not previously known to the Masakeñarî and Cashew Island experts who participated in the surveys and, to the best of our knowledge, are not described in the academic literature. Yet, as previously noted, this study should not be interpreted as a comprehensive archaeological survey of the region. Professional archeological assessments are urgently needed to understand the cultural value of the Acarai-Corentyne Corridor in the detail it clearly merits. We hope this preliminary data helps to justify and motivate that work. Taken together with the evidence of social movement and connectivity described previously, it is clear that the Acarai-Corentyne Corridor is a place of human activity, both in the present for Indigenous peoples in nearby villages and in the deeper human past. Its high-quality biodiversity suggests that this deep human history is compatible with, and strengthens, the conservation future for the area.

Previous observers have recognized the deep human history of the upper Essequibo drainage, though startlingly little professional archaeology has taken place even there. Available archeological evidence in the Acarai-Corentyne Corridor is concentrated in the uppermost part of the basin,

Figure 47. Map of social features identified by Masakeñarî and Parabara experts along the stretch of the Essequibo River visited during the rapid inventory.



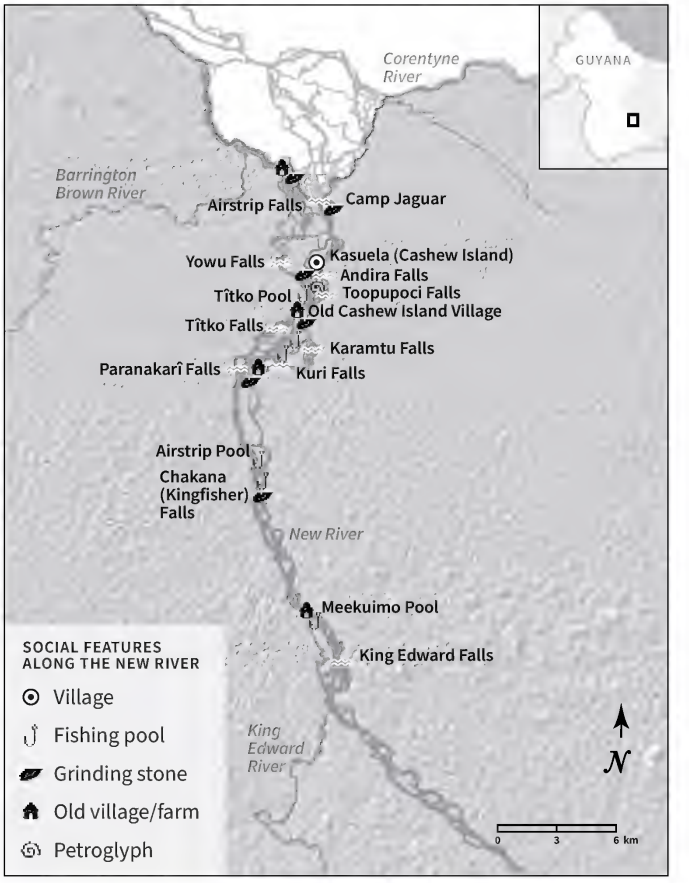
above the Kuyuwini River, and far to the north in the former Upper Essequibo Conservation Concession (UECC). Guyanese archeologist Denis Williams (1979a, b) conducted an extensive survey of petroglyphs on the Kassikaityu River and the nearby stretch of the Essequibo River. American archeologists Clifford Evans and Betty Meggers (1960) collected over 14,000 pottery shards during excavations from 35 historic occupation and former farm sites from between the Kuyuwini and Kassikaityu mouths up the Essequibo. In 2006, Guyanese archeologist George Simon carried out two archeological surveys with Conservation International-Guyana within the UECC, visiting the villages of Apoteri, Rewa, and Crash Water and exploring sites between Smyths River and King William IV Falls (Simon 2007). Along the northwestern boundary of the Acarai-Corentyne Corridor, they documented six former habitation sites, 35 petroglyphs, nearly 300 grinding surfaces spread across eight distinct sites, and extensive pottery shards.

Much less is understood about the intervening stretch of the Essequibo River. It is likely that the series of major waterfalls between Murray's Fall, just south of the former UECC, and Great Falls, to the north of the Kuyuwini mouth (Fig. 2A), formed a natural barrier to Indigenous movement

and trade along the river. European explorer Robert Schomburgk's 1836 expedition turned back at King William IV Falls, and geologist Brown (1876, 235) reported not seeing other people from Apoteri until near the mouth of the Kuyuwini during the first known colonial ascent of that stretch of the Essequibo. Yet Brown's report also notes an earlier Indigenous voyage led by Manarowah, who captured Taruma people who were enslaved by Dutch settlers, that occurred a century earlier, around 1770 (Brown 1876, 235). Thus it is clear there were at least some forms of Indigenous movement through this series of major falls. A 1969 geological expedition suggested the entire upper Essequibo was an Indigenous water route based on the common occurrence of grinding surfaces and petroglyphs throughout, including one in the less well-understood stretch near Ité Falls. A South Rupununi District Council-led Wapishana cultural mapping project documented named and known places along the Essequibo below the Kuyuwini mouth, an area heavily traversed during the balata era and the eastern extent of Wapishana ancestral territory (SRDC 2012). Further anthropological and archeological research is urgent to better understand the area's deeper human past as well as its relations to contemporary Indigenous communities.

Our work with Masakeñarî experts revealed a number of interesting findings that complement previous work while suggesting future research directions. In initial conversations on the social and ecological history of the region, community members showed a keen interest in visiting and documenting sites they knew (or suspected) contained petroglyphs and other evidence of past habitation. Their interest propelled our survey along the Essequibo, which, while not comprehensive, noted six sites (three of which not previously registered) containing at least 26 petroglyphs and 15 sharpening stones or grooves (Table 14; Fig. 47). Energized by this work, local experts avidly swapped stories about previous trips along the river with elders, remembering the situations in which they had learned about glyphs or ancient sites. For example, Syra Ayaw recalled a boyhood fishing trip with his uncles and father to Yewará Imicithopunho, where he remembers a large circular and swirling glyph in a privileged position high on a rock face overlooking the river's left bank. While Syra led us in scouting this location nearly 50 years later, after a two-hour search our team concluded that the glyph had likely eroded away: there was a large amount of surface cleavage on the vertical rock faces. Disappointed yet undaunted, Syra seemed pleased to have revisited the site and energized to continue the survey. After the rapid inventory, Syra identified a photograph from

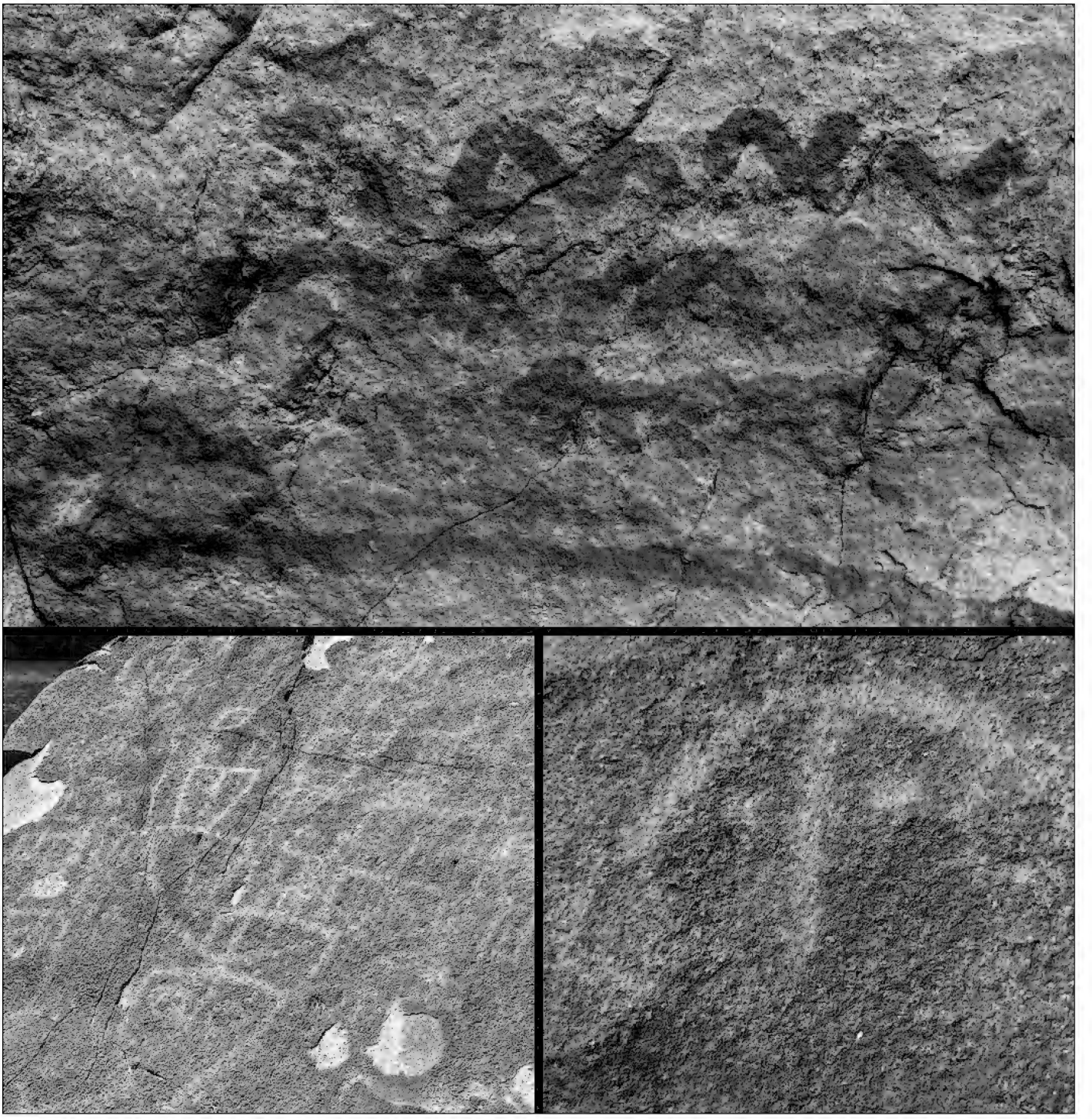
Figure 48. Map of social features identified by Cashew Island experts along the stretch of the New River visited during the rapid inventory.



Dubelaar (1986, 166) that corresponded to his memory of the petroglyph site, from roughly the same location we searched.

The glyph complex at Kunurima Falls (Bubumana Rock) is, without question, the most extensive petroglyph site within the area we traveled, and has been widely reported and analyzed (Schomburgk 1840, 168–169; Brown 1873, 257; 1876, 224; Farabee 1916, 90–91; Berrangé and Johnson 1972, 47; Dubelaar 1986, 166–168; Figs. 12D, 12F). Syra Ayaw and other Masakeñarî experts had made many previous trips to this site, but seemed to relish the opportunity to spend time tracing and photographing known glyphs, as well as attempting to find ones they had never noticed before. This enthusiasm crested to utter thrill when our team documented glyphs in entirely new places, where no one had heard mention of them before. At Tipa, an old village site just upriver from the Kuyuwini mouth, Syra found a series of glyphs with unmistakable fish and water iconography, located well below the normal waterline for the dry season (Fig. 12C, 49). Visibly moved by finding them, Syra immediately interpreted their significance as a series of instructions for procuring fish at this site during the dry season, likely using traps or weirs. To these findings we can

Figure 49. Glyphs at Tipa (top), Wiira (bottom left), and Amaci Falls (bottom right), along the upper Essequibo River in southern Guyana. Photographs taken by Jeremy Campbell during a rapid inventory of the Acarai-Corentyne Corridor.



add reports of petroglyphs at Wiira and Amaci Falls (Fig. 49) that were unknown to local experts and, to the best of our knowledge, undescribed or only briefly mentioned in the literature. In addition, along the Essequibo as far north as Axawaimo we recorded several stone grinding surfaces, or sharpening grooves, used to hone the edge of stone axes, adzes, spear points, or arrowheads.

For Yamochi, the survey of landscape features guided by local experts' ideas of socially significant or otherwise noteworthy sites created an open discussion while traveling. There were names of places along the Essequibo, as well as the

stories behind those names, that were new information despite his growing up and living in Masakeñarî. Hearing these stories and seeing the petroglyphs motivated Yamochi's curiosity about potential past events that were not part of contemporary residents' collective memory. He was especially interested in seeing grinding surfaces where stone tools had been sharpened, linking those with the knowledge and skill required to fell trees in the past, and studied the forest for signs of former farming places and potential secondary regrowth while walking the trail system. Excitement around these insights was not limited to Yamochi or Ayaw, but rather circulated broadly among the team of local Waiwai experts. We find this engagement with the social and material history of the region to be an exciting foundation for community-based participatory archaeology (see Atalay 2012), which in the future could yield varied and textured insights into the deep and more recent history of the Acarai-Corentyne Corridor. Furthermore, local experts' motivation to learn more about these sites can serve as an asset for their long-term preservation and interpretation as places that are integral to Guyana's national cultural heritage.

In contrast to the Essequibo, very little has been documented about the human histories of the New River. For Brown, who coined the name 'New River' during his 1870 voyage because Schomburgk had not seen it on his 1843 trip up the Corentyne, the New River was "entirely destitute of human inhabitants" (1876, 337). Yet in our participatory mapping of just under 80 km of the river, we recorded seven unique sites with evidence of deep human history. The account we heard of Indigenous Okomoyana ('Wasp People')—one of the

Figure 50. The Camp New River landing contained at least 15 grinding surfaces, outlined here with charcoal. Note the clusters on the upper left and middle center, with others in the bottom right near the water line. Photograph taken by Elliott Oakley during a rapid inventory of the Acarai-Corentyne Corridor.

Indigenous groups who relocated to the Sipaliwini River during the mid-20th century missionization process—living up the New River in the past adds even more weight to the need to revise Brown's characterization with further research. Okomoyana-identifying people living on the Suriname side of the Corentyne characterize the area at the mouth of the Lucie River, just downstream of Cashew Island, as 'Pehkëtë,' the ancestral territory of the Okomoyana (Mans 2012). Most striking, the site selected by local experts for the location of Camp New River featured no fewer than 15 sharpening surfaces on the granite outcrop that served as a canoe landing spot (Fig. 50). Yamochi was the first to notice grinding surface grooves on our arrival. Since the river was at its dry season ebb, we could clearly observe the broad and smooth grooves, clumped together in groups of two to three at different heights, suggesting that sharpening of stone tools occurred throughout different times of year as river levels changed. With this evidence of past human presence in mind, he noticed a familiar-looking leaf growing from a green shoot of a vine that had been cut during the campsite construction a month earlier (Fig.12M). Botanist Marcos Rios confirmed it was wild cassava (*Manihot* sp.), a relative of the staple crop of local Indigenous communities. A quick survey of the surrounding upland forest also revealed rich, loamy soil and a Brazil nut tree grove, hinting at previous use of this area as a camp or village site; local experts know such soils make for productive farming areas, and the distribution of Brazil nut trees has been linked with historical human occupation in Amazonia (Shepard and Ramirez 2011). Cashew Island experts reported never farming in the camp's vicinity, and not previously walking through the forests where the trail system was located. For Tikkil Kenke, who picked the specific camp location after meetings with the rapid inventory team leads, the key factors were a productive fishing pool upriver and the large exposed rock landing. There is little doubt these qualities would have also been attractive to previous generations of Indigenous inhabitants, dating back further than the social memory of Cashew Island experts.

Abundant sharpening surfaces are present in at least five more locations along the New River that are recognized by local experts as old farms, good fishing spots, or places known to be 'good campsites' (Table 14). The co-occurrence of past villages and farms with productive fishing or hunting grounds was no surprise to the team; Guyanese archaeologist Denis Williams (1979a) had already pointed out this connection along the Essequibo. Still, as our work progressed, our method of stopping to record sites known to have been farmed or lived in during the past several generations proved propitious for finding evidence of even older Indigenous habitation and resource use. We also documented a complex of several etched petroglyphs, coincident with sharpening grooves, at Orosî Falls ('Cashew' Falls, also known as Andira Falls on maps), a massive series of rapids and exposed granite outcrops just upriver from Cashew Island. This site featured the most elaborate and largest single petroglyph encountered by the team, measuring 45 x 130 cm (Fig. 51). Cashew Island experts suggested a possible interpretation as the painted design on cassava grater boards, and attested that the Orosî glyphs and grooves were certainly present prior to the establishment of the current village in 2000. Indeed, Dubelaar (1986, 168) notes that the glyph was photographed in 1965 by Dutch officials scouting the area for its hydropower potential. Our team had stopped at the site expecting to document one, or possibly two, large petroglyphs. In fact, our survey turned up several additional etchings associated with the large, possible grater motif glyph, and a total of 12 glyphs spread over a 50-m^2 area at the rapids. Tina Kenke, who lives in nearby Cashew Island and pilots the New River frequently, was very interested to discover these additional glyphs, and spent several hours tracing, photographing, and hunting for new finds. As our work took us farther up the New River, we noted a total of 14 petroglyphs and at least 42 sharpening surfaces across six sites.

Notoriously hard to date, this evidence in stone nevertheless suggests Indigenous utilization of the New River from at least before iron or steel tools became widely available in the early 20th century. Further research should explore the connection between the Orosî Falls site and well-documented sites on the Corentyne River, such as Wonotobo Falls and Timehri (Duin 2017). Keen to contribute to telling the story of this place, a Cashew Island resident produced a stone axehead he found years prior while digging in the village. Smoothly hewn from sandstone and fitted with grooves to attach a handle, this axe is typical of 'Abary' stone tools which begin appearing in the archaeological record 5,000 years ago (Plew 2005; Whitehead et al. 2010).

In sum, we recorded at least 40 glyphs across seven sites and 57 sharpening grooves at ten sites along the Essequibo and New rivers (six locations featured both glyphs and grooves). Eight old farm or village sites were also attested. Tantalizing as this accumulated evidence may be, we must stress that this was not an archaeological expedition. However, our landscape and watershed mapping resulted in many new records of petroglyphs and grooves for sharpening stone tools, both of which occur in large densities and over wide expanses of the study area. Furthermore, it is clear that local experts navigate a

Figure 51. An elaborate glyph at Orosî Falls on the New River. Photograph taken by Jeremy Campbell during a rapid inventory of the Acarai-Corentyne Corridor.

region replete with acknowledged historical significance, and that residents have a strong interest in understanding these sites as evidenced in their crucial contributions in this investigation. Old village and farm sites are linked to generations-old cycles of movement, cultivation, and hunting practices that keep these sites fresh in local memory. Smoothed by decades or even centuries of use, grinding surfaces are said to be the 'seats' of the Anaconda People (*Okoimoyana* in Waiwai), who live in the river but occasionally emerge in human form to walk among people (Fock 1963, 48–53). Finally, petroglyphs documented in the Acarai-Corentyne Corridor bring to mind other glyphs distributed throughout southern Guyana, calling for future studies to better understand the peoples who made them.

DISCUSSION

As noted elsewhere in this report, the Green List of the International Union for the Conservation of Nature (IUCN) recognizes protected areas that demonstrate effective, equitable, and successful conservation, and provides a global standard for excellence in the creation and management of protected areas. In the Acarai-Corentyne Corridor, it is clear that Indigenous knowledge of the landscape, capacity for responsive travel through it, and appreciation for the deep cultural histories found there are assets that align with IUCN Green List criteria (IUCN and WCPA 2017).

In terms of its broader significance for conservation, the knowledge gained and exercised through travel is a key asset in this landscape: as people who know the rivers and forests best, Indigenous partners will be the most equipped to help achieve the goals of protected areas. Capacities for frequent, timely, and effective monitoring of this vast area, for example, are among local communities' clearest contributions to future conservation in the Acarai-Corentyne Corridor. In fact, it does not go too far to say that Indigenous travelers through the rivers and trails of the Corridor are the *only* actors with the experience and aptitude to provide on-the-ground monitoring along the routes that they alone maintain. Indigenous leadership in area management is key to achieving IUCN Green List Standard 1.3 (Governance Vitality and Capacity to Respond Adaptively.) However, it is important to note that Indigenous community resource mapping was beyond the scope of the current study. To ensure conservation success, it is vital to assess more rigorously all activities undertaken by Indigenous communities in the Acarai-Corentyne Corridor. Steps to understand and engage community outlooks on the future of the region will go a long way to achieving IUCN Green List Standards 2.4 (Understanding the Social and Economic Context) and 3.1 (Developing and Implementing a Long-Term Management Strategy.)

Furthermore, this study reveals that local populations are motivated to protect and assure a sustainable future for the entirety of the Acarai-Corentyne Corridor. Our methodological approach was propelled in large part by local experts' excitement to visit and understand socially significant places. The abundant petroglyphs, sharpening grooves, and old village and farm sites we found are convincing evidence of broad and varied Indigenous resource use in this area across millennia. These sites are important, both in terms of Guyana's national patrimony and within the broader context of understanding human mobility and cultural change in the Americas at the broadest scale. What is perhaps even more

Table 14: Petroglyphs and grinding surfaces visited during a rapid inventory of the Acarai-Corentyne Corridor.

Site name	Also documented by	Location	Site description
Essequibo River sites, descending from Urupiri Creek (W. Amuku River) to the Kuyuwini River			
Wiira (Labba or Paca) Falls	Possibly Williams's (1979a, 1979b) sites ES3, ES4, and/or ES5	Essequibo River, below Urupiri Creek	Granite boulders with at least seven glyphs (including one clear fish trap) and several sharpening stones
Amaci (Anteater) Falls, a.k.a Watu Falls		Essequibo River, just below Amuku Camp	Three sharpening grooves associated with a narrow channel through the falls; just downstream there is a stylized monkey petroglyph
Yawanapi, a.k.a. Wana Wana		Essequibo River, below the Kassikaytu River	Large boulder with two parallel etched lines, ~1.5 m in length at site associated with anaconda
Kunurima (Red-tailed Fish) Falls, a.k.a Bubamana Rock	Dubelaar (1986, 166–168) summarizes prior documentation by Schomburgk (1840, 168–69), Brown (1876, 224), Farabee (1916, 90–91), and Berrangé and Johnson (1972, 47)	Essequibo River	Large granite slab formation with extensive petroglyphs with a variety of motifs: animal and anthropomorphic figures, fish traps, and abstract designs among the >15 individual glyphs
Yewará Imicithopunho	Likely Dubelaar's (1986, 166) 'Essequibo River Between Mouth of Kuyuwini Site 10,' based on photos from Berrangé	Essequibo River, above Monkey Jump Creek	Highly fractured and eroded stone formations where local experts remember a large, swirled glyph that has apparently been destroyed. At least five sharpening grooves are visible here
Tipa, a.k.a. Axawaimo		Essequibo River, above the Kuyuwini River	Abstract glyphs complex with water symbols and fish motifs. Visible only during the dry season, glyphs are on a granite slab ('Tipa') opposite an old farm and village site ('Axawaimo')
New River sites, descending from King Edward Falls to Barrington Brown River			
Chakana (Kingfisher) Falls		New River	Broad and shallow rapids where the river widens; five deep and parallel sharpening grooves at propitious fishing area on the left bank
Paranakarî (Whiteman) Falls		New River	Five sharpening grooves at old farm and village site just above shallow falls
Old Cashew Island Village Site		New River	Four shallow sharpening grooves on flat granite slab, associated with faint glyphs that are either highly eroded or more contemporary etchings
Orosî (Cashew) Falls, a.k.a. Andira Falls	Dubelaar (1986, 40–41) as 'Boven-Corantyn, Zaruma Falls'	New River, above Cashew Island Village	Impressive stone and boulder formations at this significant 3-m drop in water level. Highly detailed, well-preserved glyph complex with impressive dimensions (4 x 1 m) features what is possibly a cassava grater; several other smaller abstract glyphs (for a total of 12 overall) as well as six sharpening surfaces were recorded
Camp Jaguar		New River, below Cashew Island Village	Seven sharpening grooves recorded, including both shallow surfaces and deep, narrow grooves
Camp New River		Landing for Camp New River	Fifteen sharpening grooves documented at landing for Camp New River: important to note that this is very likely an old farm and village site, due to prevalence of Brazil nut trees and wild cassava

important for conservation, however, is the fascination and engagement with these sites exhibited by contemporary communities as we co-encountered and co-described them. Waiwai, Wapishana, and Trio peoples see in these sites historical and cultural connections to their past, and local support for conserving access to and stewardship of these sites is compatible with biodiversity conservation goals as well. The IUCN Green List Standard 4.3 identifies 'Demonstrating Conservation of Cultural Values' as a crucial aspect of natural area creation, and defines 'cultural values' as including "cultural practices, knowledge, songs, stories, places or features of cultural significance, sacred sites, built heritage, art, relics, human remains, and natural landforms, flora, fauna, or minerals that have cultural meaning" (IUCN and WCPA 2017, 11,14,15–23). We contend that both the presence of archaeological sites throughout the Acarai-Corentyne Corridor and the local knowledge that led our team to be able to travel to and document these sites are invaluable assets for the future conservation of this region.

CONCLUSION

Given the histories of movement, use, and cultural values and stories associated with the region, it is clear that the Acarai-Corentyne Corridor is a thoroughly social landscape. While the study area for this rapid inventory does not include any Indigenous villages, it contains dozens if not hundreds of historic sites and is actively utilized for a variety of purposes. In this chapter we have emphasized the role that the Corridor plays in a web of connectivity between dispersed Indigenous villages bound together through shared kinship, history, and the contemporary travels through which these ties are substantiated. Local ecological knowledge is crucial for traveling through the Corridor, which in turn forms a central part in a transnational system of moving people and ideas. The same webs of connectivity that link dispersed communities to the vistas and resources of the Corridor can also play signal roles in future landscape management, for example through community-based monitoring and the protection of culturally significant sites. Though much remains to be explored in terms of the human history of southeastern Guyana, the potential for Indigenous leadership in stewarding this landscape is clear.

Appendices

Vascular plants

Vascular plants recorded at four sites within the Acarai-Corentyne Corridor of southern Guyana. The first three sites were inventoried during a 5–24 November 2024 rapid inventory by Marcos A. Ríos Paredes, Kaslyn Holder-Collins, Nigel Pitman, Cemci "James" Suse, Stephen Suse, Matias Waiwai, Tikkil Kenke, Jo Yacipa, Reuben Yamochi, Ronell Lewis, Christopher Bhola, Nehru Narine, and Zach Kachian. The fourth site, the former Upper Essequibo Conservation Concession, was inventoried on 18–31 January 2007 and 14 September–11 October 2008 by Karen Redden, Kenneth J. Wurdack, Andrew Rodriguez, Paul Benjamin, Claudius Perry, Dave Singh, Eustace Alexander, Padmini Ragnauth, Elvis Joseph, Nigel John, Henry James, and Hendricks Simon. Data from the 2007 and 2008 expeditions was obtained from Kelloff et al. (2023). Taxonomic nomenclature and family placement were standardized via the Taxonomic Name Resolution Service (https://tnrs.biendata.org), using the World Checklist of Vascular Plants.

Family	Species	Campsite				Voucher specimen	Status
		Amuku	Monkey Jump	New River	UECC		
Acanthaceae	*Dianthera comata* cf.	–	–	x	–	KH650	
Acanthaceae	*Dianthera secunda*	–	–	–	x		
Acanthaceae	*Dianthera* sp.	–	–	x	–	KH635	
Acanthaceae	*Mendoncia hoffmannseggiana*	–	–	–	x		
Achariaceae	*Carpotroche crispidentata*	–	x	–	–		
Achariaceae	*Lindackeria* sp.	–	x	–	–		
Alismataceae	*Echinodorus* sp.	–	–	x	–	KH539, KH612	
Anacardiaceae	Anacardiaceae spp. (not yet sorted)	–	–	–	x		
Anacardiaceae	*Anacardium giganteum*	x	x	x	–		
Anacardiaceae	*Spondias* sp.	–	–	x	–	NP11569	
Anacardiaceae	*Tapirira guianensis*	x	x	x	–		
Annonaceae	*Anaxagorea acuminata* cf.	x	–	–	–	KH530	
Annonaceae	*Anaxagorea dolichocarpa*	–	–	–	x		
Annonaceae	*Anaxagorea* sp. (not yet sorted)	x	–	–	–	KH516, KH528	
Annonaceae	*Annona* "naranja"	–	x	–	–		
Annonaceae	*Annona haematantha*	–	–	–	x		
Annonaceae	*Annona hypoglauca*	–	–	–	x		
Annonaceae	*Annona mucosa*	–	–	–	x		
Annonaceae	*Bocageopsis multiflora*	x	x	x	–	NP11352, NP11584	
Annonaceae	*Cymbopetalum brasiliense*	–	–	–	x		
Annonaceae	*Duguetia* "large leaf"	x	–	x	–		
Annonaceae	*Duguetia cauliflora*	x	x	x	–		
Annonaceae	*Duguetia neglecta*	–	–	–	x		
Annonaceae	*Duguetia pycnastera*	–	x	–	–		
Annonaceae	*Duguetia quitarensis*	–	–	–	x		
Annonaceae	*Duguetia stelechantha*	x	–	–	–	KH490	NR
Annonaceae	*Duguetia yeshidan*	–	–	–	x		
Annonaceae	*Duguetia* spp. (not yet sorted)	x	x	–	x	KH492, KH502, KH564, KH572, NP11395	
Annonaceae	*Ephedranthus guianensis*	–	–	–	x		
Annonaceae	*Fusaea longifolia*	–	–	–	x		
Annonaceae	*Guatteria citriodora*	–	–	–	x		
Annonaceae	*Guatteria* spp. (not yet sorted)	x	x	x	x	KH622, NP11553, NP11561, NP11576, NP11606, NP11701	
Annonaceae	*Pseudoxandra lucida*	–	–	–	x		

Vascular plants

Family	Species	Campsite				Voucher specimen	Status
		Amuku	Monkey Jump	New River	UECC		
Annonaceae	*Pseudoxandra* sp.	–	x	x	–	KH597	
Annonaceae	*Trigynaea caudata*	–	–	–	x		
Annonaceae	*Unonopsis glaucopetala*	–	–	–	x		
Annonaceae	*Unonopsis guatterioides*	–	–	–	x		
Annonaceae	*Unonopsis stipitata* cf.	x	x	–	–	KH521, KH555	
Annonaceae	*Xylopia* sp.	–	–	–	x		
Annonaceae	Annonaceae spp. (not yet sorted)	–	x	x	x	NP11334, NP11609, NP11610, NP11647, NP11654, NP11675, NP11688	
Apocynaceae	*Aspidosperma* spp. (not yet sorted)	–	x	x	x	NP11341, NP11346, NP11370, NP11404, NP11464, NP11578, NP11579, NP11651	
Apocynaceae	*Blepharodon* sp.	–	–	–	x		
Apocynaceae	*Couma guianensis*	x	x	x	–		
Apocynaceae	*Forsteronia* sp.	–	–	–	x		
Apocynaceae	*Geissospermum argenteum*	–	x	x	–	NP11437, NP11544	
Apocynaceae	*Himatanthus* sp.	x	x	–	–		
Apocynaceae	*Lacmellea* sp.	–	x	x	–	NP11378	
Apocynaceae	*Malouetia* sp.	x	x	–	–		
Apocynaceae	*Matelea stenopetala*	–	–	–	x		
Apocynaceae	*Mesechites trifidus*	x	x	x	–	KH629	
Apocynaceae	*Odontadenia semidigyna* cf.	–	–	x	x	KH636	
Apocynaceae	*Prestonia surinamensis*	–	–	x	–	KH638	
Apocynaceae	*Tabernaemontana macrocalyx* cf.	x	x	–	–		
Apocynaceae	*Tabernaemontana undulata*	x	x	x		KH522, KH590	
Apocynaceae	*Tabernaemontana* spp. (not yet sorted)	x	x	x	x	KH575	
Apocynaceae	Apocynaceae spp. (not yet sorted)	–	–	–	x		
Araceae	*Anthurium gracile*	–	–	–	x		
Araceae	*Heteropsis flexuosa* cf.	x	x	x	x		
Araceae	*Heteropsis tenuispadix*	–	–	–	x		
Araceae	*Monstera obliqua*	–	–	–	x		
Araceae	*Montrichardia arborescens*	–	–	x	–	KH613	
Araceae	*Philodendron fragrantissimum*	x	x	x	–		
Araceae	*Philodendron hederaceum*	–	–	–	x		
Araceae	*Philodendron hylaeae*	–	–	–	x		
Araceae	*Philodendron rudgeanum* cf.	–	–	–	x		
Araceae	*Philodendron* sp.	–	–	x	–	KH620	

LEGEND

Vouchers

KH = Kaslyn Holder-Collins

NP = Nigel Pitman

Status

CR (Guyana) = Critically Endangered in Guyana

CR (IUCN) = Globally Critically Endangered

EN (IUCN) = Globally Endangered

II = CITES Appendix II

NR = New record for Guyana

NT (IUCN) = Globally Near Threatened

VU (IUCN) = Globally Vulnerable

Appendix 1

Vascular plants

Family	Species	Campsite				Voucher specimen	Status
		Amuku	Monkey Jump	New River	UECC		
Araceae	*Rhodospatha* sp.	x	–	–	–	KH527	
Araceae	Araceae spp. (not yet sorted)	–	–	–	x		
Araliaceae	*Didymopanax morototoni*	x	–	x	–		
Araliaceae	*Schefflera* sp.	–	–	–	x		
Arecaceae	*Astrocaryum aculeatum*	x	x	x	–		
Arecaceae	*Astrocaryum jauari*	x	–	–	–		
Arecaceae	*Astrocaryum gynacanthum*	x	x	x	–		
Arecaceae	*Attalea maripa*	–	x	x	–		
Arecaceae	*Attalea microcarpa*	x	x	x	–		
Arecaceae	*Bactris acanthocarpa*	–	–	x	–		
Arecaceae	*Bactris acanthocarpa* var. *humilis*	–	–	–	x		
Arecaceae	*Bactris hirta* var. *lakoi*	x	x	x	–	KH588	
Arecaceae	*Bactris riparia* cf.	–	x	x	–		
Arecaceae	*Bactris simplicifrons*	–	–	–	x		
Arecaceae	*Bactris* spp. (not yet sorted)	x	–	–	x	KH488	
Arecaceae	*Desmoncus polyacanthos* cf.	x	–	–	–		
Arecaceae	*Euterpe oleracea*	x	x	x	x		
Arecaceae	*Euterpe precatoria*	x	x	x	–		
Arecaceae	*Geonoma baculifera*	–	–	–	x		
Arecaceae	*Geonoma leptospadix*	–	–	–	x		
Arecaceae	*Geonoma maxima s.l.*	x	x	x	–		
Arecaceae	*Geonoma* sp.	x	x	x	–	KH533, KH573, KH587	
Arecaceae	*Hyospathe elegans*	–	–	x	x	KH642	
Arecaceae	*Iriartella setigera*	x	x	x	–	KH474	
Arecaceae	*Mauritia flexuosa*	x	x	x	–		
Arecaceae	*Mauritiella armata* cf.	x	x	–	–		
Arecaceae	*Oenocarpus bacaba*	x	x	x	–		
Arecaceae	*Oenocarpus bataua*	x	x	x	–		
Arecaceae	*Socratea exorrhiza*	x	x	x	x		
Arecaceae	Arecaceae spp. (not yet sorted)	–	–	–	x		
Asteraceae	*Lepidaploa gracilis*	–	–	–	x		
Asteraceae	*Mikania* sp.	–	–	–	x		
Bignoniaceae	*Adenocalymma inundatum*	–	–	–	x		
Bignoniaceae	*Amphilophium magnoliifolium*	–	–	–	x		
Bignoniaceae	*Bignonia aequinoctialis*	–	–	–	x		
Bignoniaceae	*Bignonia binata*	–	–	–	x		
Bignoniaceae	*Bignonia* sp.	–	–	–	x		
Bignoniaceae	*Fridericia* sp.	–	–	x	x	KH619	
Bignoniaceae	*Godmania aesculifolia*	–	–	–	x		
Bignoniaceae	*Jacaranda copaia*	x	x	x	x		
Bignoniaceae	*Jacaranda obtusifolia*	–	x	x		KH581	
Bignoniaceae	*Jacaranda obtusifolia* subsp. *rhombifolia*	–	–	–	x		

Vascular plants

Family	Species	Campsite				Voucher specimen	Status
		Amuku	Monkey Jump	New River	UECC		
Bignoniaceae	*Jacaranda* sp.	–	–	x	–	NP11452	
Bignoniaceae	*Mansoa alliacea* cf.	–	–	x	–		
Bignoniaceae	*Martinella obovata*	–	–	–	x		
Bignoniaceae	*Tabebuia insignis*	x	–	–	–	KH483	NT (IUCN), II
Bignoniaceae	*Tanaecium bilabiatum*	–	–	–	x		
Bignoniaceae	*Tanaecium pyramidatum*	x	x	x	x	KH603	
Boraginaceae	*Cordia nodosa*	x	–	–	–		
Boraginaceae	*Cordia* sp.	–	–	x	–	NP11702	
Boraginaceae	*Myriopus paniculatus* var. *spigeliiflorus*	–	–	–	x		
Boraginaceae	*Varronia schomburgkii*	–	–	–	x		
Boraginaceae	Boraginaceae spp. (not yet sorted)	–	–	–	x		
Bromeliaceae	*Aechmea bromeliifolia*	x	x	–	–	KH507	
Bromeliaceae	*Aechmea mertensii*	–	–	x	x	KH637	
Bromeliaceae	*Aechmea rubiginosa*	x	–	–	–		
Bromeliaceae	*Pitcairnia caricifolia*	–	–	–	x		
Bromeliaceae	*Tillandsia usneoides*	–	–	–	x		
Bromeliaceae	Bromeliaceae spp. (not yet sorted)	–	–	–	x		
Burmanniaceae	*Apteria aphylla*	x	–	–	–		
Burmanniaceae	Burmanniaceae sp. (not yet sorted)	–	–	–	x		
Burseraceae	*Protium altissimum*	x	x	x	–	NP11581, NP11582	
Burseraceae	*Protium aracouchini*	–	–	–	x		
Burseraceae	*Protium guianense*	–	–	–	–	NP11583	
Burseraceae	*Protium heptaphyllum*	–	–	–	x		
Burseraceae	*Protium heptaphyllum* subsp. *heptaphyllum*	–	–	–	x		
Burseraceae	*Protium polybotryum*	–	–	–	x		
Burseraceae	*Protium rhoifolium*	x	x	–	x	KH468	
Burseraceae	*Protium sagotianum*	x	x	x	–	NP11432	
Burseraceae	*Protium* spp. (not yet sorted)	–	x	x	x	KH577, KH630, NP11330, NP11368, NP11384, NP11431, NP11453, NP11454, NP11511, NP11512, NP11587, NP11612, NP11665, NP11669	
Burseraceae	*Trattinnickia* sp.	–	x	–	–	NP11455	

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Vascular plants

Family	Species	Campsite				Voucher specimen	Status
		Amuku	Monkey Jump	New River	UECC		
Burseraceae	Burseraceae spp. (not yet sorted)	–	x	x	–	NP11332, NP11339, NP11376, NP11616, NP11640	
Cactaceae	*Cereus hexagonus* cf.	–	x	–	–		
Cactaceae	*Epiphyllum phyllanthus*	–	x	–	–		II
Cactaceae	*Rhipsalis baccifera*	–	–	–	x		II
Cactaceae	*Rhipsalis* sp.	–	–	–	x		
Calophyllaceae	*Calophyllum brasiliense* cf.	–	–	x	–	KH589	
Calophyllaceae	*Caraipa densifolia* cf.	x	x	–	–	KH485	
Calophyllaceae	*Caraipa* sp.	–	–	–	x		
Caricaceae	*Jacaratia* sp.	–	–	x	–		
Caryocaraceae	*Caryocar* sp.	–	x	–	x		
Celastraceae	*Cheiloclinium cognatum*	x	x	–	–		
Celastraceae	*Cheiloclinium hippocrateoides*	–	–	–	x		
Celastraceae	*Cheiloclinium* sp.	–	–	–	x		
Celastraceae	*Hippocratea volubilis*	–	–	–	x		
Celastraceae	*Maytenus* sp.	–	–	–	x		
Celastraceae	*Peritassa laevigata*	–	–	–	x		
Celastraceae	*Peritassa pruinosa*	–	–	–	x		
Celastraceae	*Prionostemma aspera*	–	–	x	–	KH610	
Celastraceae	*Salacia impressifolia*	–	–	–	x		
Celastraceae	*Salacia* sp.	–	x	–	x		
Celastraceae	Celastraceae spp. (not yet sorted)	–	–	–	x		
Chrysobalanaceae	*Couepia bracteosa*	x	x	–	–		
Chrysobalanaceae	*Couepia* sp.	–	–	x	x	KH615	
Chrysobalanaceae	*Hirtella* spp. (not yet sorted)	x	–	x	x	KH551, KH646	
Chrysobalanaceae	*Licania* "ace"	–	x	–	–		
Chrysobalanaceae	*Licania* "credit card"	–	x	x	–	NP11316, NP11623	
Chrysobalanaceae	*Licania* "green"	–	–	x	–	NP11621, NP11642, NP11646	
Chrysobalanaceae	*Licania* "hairy"	–	–	x	–	NP11622	
Chrysobalanaceae	*Licania* "small"	–	–	x	–	NP11613, NP11614	
Chrysobalanaceae	*Licania bernardi* cf.	–	x	–	–	NP11443	
Chrysobalanaceae	*Licania densiflora* cf.	–	–	x	–		
Chrysobalanaceae	*Licania laxiflora* cf.	x	x	x	x		
Chrysobalanaceae	*Licania majuscula* cf.	–	–	x	x	NP11620	
Chrysobalanaceae	*Licania* spp. (not yet sorted)	–	x	x	x	NP11402, NP11429, NP11440, NP11441, NP11444, NP11449, NP11456, NP11457, NP11458, NP11617, NP11618, NP11624, NP11625, NP11626, NP11627, NP11628, NP11629, NP11630, NP11631, NP11632, NP11633, NP11634, NP11660, NP11662, NP11670, NP11699	
Chrysobalanaceae	*Parinari rodolphi*	x	x	x	–		
Chrysobalanaceae	*Parinari* spp. (not yet sorted)	–	–	x	x	NP11619	

Vascular plants

Family	Species	Campsite				Voucher specimen	Status
		Amuku	Monkey Jump	New River	UECC		
Chrysobalanaceae	Chrysobalanaceae spp. (not yet sorted)	–	x	x	–	NP11350, NP11356, NP11374, NP11393, NP11372, NP11401, NP11405, NP11427	
Clusiaceae	*Clusia* spp. (not yet sorted)	x	x	x	x	KH605	
Clusiaceae	*Garcinia* sp. 1	–	x	x	–	NP11322	
Clusiaceae	*Garcinia* sp. 2	–	x	–	–	NP11344, NP11363	
Clusiaceae	*Symphonia globulifera*	–	x	–	–		
Clusiaceae	*Tovomita obovata*	–	x	x	–	NP11357, NP11648, NP11666, NP11678	
Clusiaceae	Clusiaceae spp. (not yet sorted)	–	–	x	–	NP11486, NP11565, NP11566	
Combretaceae	*Combretum laxum*	–	x	x	x		
Combretaceae	*Combretum* spp. (not yet sorted)	–	x	x	x	KH562, KH600, KH611	
Combretaceae	*Terminalia parvifolia* cf.	x	x	–	–		
Combretaceae	*Terminalia* spp. (not yet sorted)	–	–	x	x	NP11653, NP11663	
Commelinaceae	*Commelina* sp.	x	–	–	–	KH535	
Connaraceae	*Connarus perrottetii*	x	x	x	x		
Connaraceae	*Connarus punctatus*	–	–	–	x		
Connaraceae	*Rourea* sp.	–	–	–	x		
Convolvulaceae	*Calycobolus glaber*	–	–	–	x		
Convolvulaceae	*Dicranostyles scandens*	–	–	–	x		
Convolvulaceae	*Ipomoea aquatica*	–	–	x	–	KH625	
Convolvulaceae	*Ipomoea* sp.	–	–	–	x		
Convolvulaceae	*Maripa paniculata*	–	–	–	x		
Convolvulaceae	*Maripa reticulata* var. *reticulata*	–	–	–	x		
Convolvulaceae	*Maripa* cf.	–	–	–	x		
Costaceae	*Costus scaber*	–	–	–	x		
Costaceae	*Costus* sp.	x	–	x	–		
Cucurbitaceae	*Gurania nigrescens*	–	–	–	x		
Cyclanthaceae	*Ludovia* sp.	–	–	–	x		
Cyclanthaceae	Cyclanthaceae spp. (not yet sorted)	–	–	x	x		
Cyperaceae	*Bisboeckelera irrigua*	–	–	–	x		
Cyperaceae	*Calyptrocarya glomerulata*	–	–	–	x		
Cyperaceae	*Cyperus aggregatus*	–	–	–	x		
Cyperaceae	*Cyperus luzulae*	x	x	–	–		
Cyperaceae	*Diplasia karatifolia*	x	–	–	x	KH469	
Cyperaceae	*Hypolytrum sphaerostachyum*	–	–	–	x		
Cyperaceae	*Scleria cyperina* cf.	x	–	–	–		

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Appendix 1

Vascular plants

Family	Species	Campsite				Voucher specimen	Status
		Amuku	Monkey Jump	New River	UECC		
Cyperaceae	*Scleria microcarpa*	–	–	–	x		
Cyperaceae	*Scleria secans*	–	–	–	x		
Cyperaceae	Cyperaceae spp. (not yet sorted)	x	–	–	–	KH484,KH503,KH508, KH511, KH512, KH513, KH542, KH543	
Dichapetalaceae	*Tapura guianensis*	x	x	x	x	KH586	
Dichapetalaceae	*Tapura* spp. (not yet sorted)	–	–	x	–	NP11556, NP11683	
Dilleniaceae	*Doliocarpus dentatus*	x	x	x	x		
Dilleniaceae	*Doliocarpus gracilis*	–	–	–	x		
Dilleniaceae	*Pinzona coriacea*	–	–	–	x		
Dioscoreaceae	*Dioscorea* sp.	–	–	–	x		
Dioscoreaceae	Dioscoreaceae sp.	–	–	–	x		
Ebenaceae	*Diospyros capreifolia*	–	–	–	x		
Elaeocarpaceae	*Sloanea* spp. (not yet sorted)	–	x	x	x	NP11354, NP11383, NP11423, NP11451, NP11552, NP11562, NP11574	
Ericaceae	Ericaceae spp. (not yet sorted)	–	–	–	x		
Erythroxylaceae	*Erythroxylum lindemanii*	–	–	–	x		
Erythroxylaceae	*Erythroxylum* sp.	x	–	–	x	KH496, KH526, KH534, KH550	
Euphorbiaceae	*Alchorneopsis floribunda*	x	–	–	–		
Euphorbiaceae	*Conceveiba guianensis*	x	x	x	–	NP11333, NP11343, NP11381	
Euphorbiaceae	*Croton* sp.	x	x	x	x		
Euphorbiaceae	*Hevea guianensis* cf.	x	x	x	–	NP11337, NP11465	
Euphorbiaceae	*Mabea* sp.	–	–	x	–	KH627	
Euphorbiaceae	*Manihot brachyloba*	–	–	x	–		
Euphorbiaceae	*Maprounea guianensis*	x	–	–	–		
Euphorbiaceae	*Omphalea diandra*	–	–	x	–		
Euphorbiaceae	*Rhodothyrsus macrophyllus*	–	–	–	x		
Euphorbiaceae	*Sagotia brachysepala* cf.	x	x	–	–	KH531, NP11416	
Euphorbiaceae	*Sagotia racemosa*	–	x	x	x		
Euphorbiaceae	*Sapium* sp.	–	–	x	–	NP11667	
Euphorbiaceae	Euphorbiaceae spp. (not yet sorted)	–	–	–	x		
Fabaceae	*Alexa imperatricis*	–	–	x	–		
Fabaceae	*Alexa wachenheimii*	–	–	–	x		
Fabaceae	*Bauhinia* sp.	–	–	–	x		
Fabaceae	*Bocoa viridiflora*	–	x	x	–	NP11310, NP11319, NP11567, NP11696	
Fabaceae	*Cedrelinga cateniformis*	x	x	x	–		
Fabaceae	*Clathrotropis brachypetala*	–	–	–	x		
Fabaceae	*Clathrotropis macrocarpa*	–	–	x	–	NP11684	
Fabaceae	*Clitoria* sp.	–	–	–	x		
Fabaceae	*Cynometra bauhiniifolia*	–	–	–	x		
Fabaceae	*Cynometra parvifolia*	–	–	–	x		
Fabaceae	*Dalbergia* sp.	–	–	x	x	KH592	

Vascular plants

Family	Species	Campsite				Voucher specimen	Status
		Amuku	Monkey Jump	New River	UECC		
Fabaceae	*Deguelia chrysophylla* cf.	x	x	x	–		
Fabaceae	*Dialium guianense*	x	x	x	–	NP11591	
Fabaceae	*Dialium* sp.	–	–	–	x		
Fabaceae	*Dinizia excelsa*	x	x	x	–		
Fabaceae	*Dioclea* sp.	x	x	x	x	KH582	
Fabaceae	*Dipteryx odorata*	x	x	–	–		II
Fabaceae	*Dipteryx* sp.	–	x	–	–	NP11320	
Fabaceae	*Eperua falcata*	–	x	x	–	KH470, KH544, KH583, KH614, NP11480	
Fabaceae	*Eperua grandiflora*	x	x	x	x		
Fabaceae	*Eperua rubiginosa*	x	x	x	x		
Fabaceae	*Eperua rubiginosa* var. *rubiginosa*	–	–	–	x		
Fabaceae	*Eperua schomburgkiana*	–	–	–	x		
Fabaceae	*Eperua* sp. (not yet sorted)	–	x	–	–	NP11349	
Fabaceae	*Hydrochorea corymbosa*	x	x	–	–		
Fabaceae	*Hydrochorea pedicellaris*	x	–	x	–		
Fabaceae	*Hymenaea oblongifolia* var. *palustris*	x	–	–	–	KH489, KH493	
Fabaceae	*Hymenolobium* spp.	x	x	–	x		
Fabaceae	*Inga alba*	x	–	x	–	KH553, KH617, KH618, KH643	
Fabaceae	*Inga auristellae*	x	x	x	–		
Fabaceae	*Inga cordatoalata*	x	–	–	–		
Fabaceae	*Inga splendens*	x	x	x	–		
Fabaceae	*Inga stipularis*	x	x	–	–		
Fabaceae	*Inga thibaudiana* cf.	–	–	x	–	NP11603	
Fabaceae	*Inga* spp. (not yet sorted)	–	x	x	x	NP11412, NP11438, NP11481, NP11489, NP11543, NP11568, NP11638	
Fabaceae	*Jupunba trapezifolia*	–	x	–	–	NP11475	
Fabaceae	*Limadendron hostmannii* cf.	–	x	x	–	NP11499, NP11695	
Fabaceae	*Machaerium* sp.	–	–	–	x		
Fabaceae	*Macrolobium acaciifolium*	x	x	x	x	KH518	
Fabaceae	*Macrolobium angustifolium*	x	x	x	x	KH633	
Fabaceae	*Macrolobium multijugum*	–	–	–	x		
Fabaceae	*Macrosamanea* sp.	–	–	x	–		
Fabaceae	*Mimosa myriadenia*	–	–	–	x		
Fabaceae	*Mora excelsa*	–	–	–	x		
Fabaceae	*Mora gonggrijpii*	–	–	–	x		

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Family	Species	Campsite				Voucher specimen	Status
		Amuku	Monkey Jump	New River	UECC		
Fabaceae	*Mucuna urens*	–	–	–	x		
Fabaceae	*Ormosia coccinea*	x	x	x	–	KH607	
Fabaceae	*Ormosia* sp.	–	x	–	x	NP11389	
Fabaceae	*Paloue riparia* cf.	–	–	x	–	KH602	
Fabaceae	*Parkia* aff. (not yet sorted)	–	x	x	–	NP11313	
Fabaceae	*Parkia gigantocarpa*	x	x	x	–	NP11364	
Fabaceae	*Parkia pendula*	x	x	x	–		
Fabaceae	*Parkia ulei*	–	–	–	x		
Fabaceae	*Peltogyne paniculata*	–	–	x	–	KH594	
Fabaceae	*Peltogyne venosa*	–	–	–	x		
Fabaceae	*Platymiscium pinnatum* cf.	x	x	–	–		
Fabaceae	*Robrichia schomburgkii*	x	x	–	–		
Fabaceae	*Schnella guianensis*	x	x	x	–		
Fabaceae	*Swartzia* "brown"	–	x	–	–	NP11471	
Fabaceae	*Swartzia arborescens* cf.	x	x	–	x		
Fabaceae	*Swartzia benthamiana* cf.	–	–	–	x		
Fabaceae	*Swartzia benthamiana* var. *benthamiana*	–	–	–	x		
Fabaceae	*Swartzia panacoco*	–	–	–	x		
Fabaceae	*Swartzia panacoco* var. *sagotii*	–	–	–	x		
Fabaceae	*Swartzia recurva* cf.	–	–	x	–	KH591	
Fabaceae	*Swartzia remigera*	–	–	–	x		
Fabaceae	*Swartzia* spp. (not yet sorted)	–	x	–	x	NP11470, NP11477	
Fabaceae	*Tachigali paniculata* cf.	–	x	–	–		
Fabaceae	*Tachigali* "feo"	–	–	x	–	NP11655	
Fabaceae	*Tachigali* spp. (not yet sorted)	–	x	x	x	NP11361, NP11479, NP11554	
Fabaceae	*Taralea oppositifolia*	x	x	x	–		
Fabaceae	*Vatairea* sp.	x	x	x	–	KH599	
Fabaceae	*Vataireopsis surinamensis* cf.	x	x	–	–		
Fabaceae	*Vouacapoua americana* cf.	–	x	x	–	NP11417, NP11542, NP11546, NP11604, NP11639	CR
Fabaceae	Fabaceae spp. (not yet sorted)	–	x	x	x	NP11325, NP11336, NP11348, NP11358, NP11373, NP11392, NP11469, NP11495, NP11496, NP11563, NP11564, NP11685	
Gentianaceae	*Coutoubea ramosa* cf.	x	–	–	–		
Gentianaceae	*Coutoubea spicata* cf.	x	–	–	–	KH541	
Gentianaceae	*Potalia* sp.	x	–	–	–	KH529, KH548	
Gentianaceae	*Voyria aurantiaca*	–	–	–	x		
Gentianaceae	*Voyria flavescens*	–	–	–	x		
Gentianaceae	*Voyria tenella*	–	–	–	x		
Gesneriaceae	*Codonanthopsis calcarata* cf.	x	x	x	x	KH606	
Gesneriaceae	*Codonanthopsis crassifolia*	–	–	–	x		
Gnetaceae	*Gnetum nodiflorum* cf.	x	–	–	–		

Vascular plants

Family	Species	Campsite				Voucher specimen	Status
		Amuku	Monkey Jump	New River	UECC		
Goupiaceae	*Goupia glabra*	x	x	x	–		
Heliconiaceae	*Heliconia chartacea*	–	–	–	x		
Heliconiaceae	*Heliconia pendula*	–	–	–	x		
Heliconiaceae	*Heliconia* spp. (not yet sorted)	–	–	x	x	KH641	
Humiriaceae	*Humiria balsamifera*	x	x	x	–		
Humiriaceae	*Sacoglottis guianensis*	x	x	x	–		
Humiriaceae	*Schistostemon macrophyllus*	–	x	x	–	NP11359, NP11369, NP11560	NR
Humiriaceae	*Vantanea* sp.	–	–	x	–	NP11580	
Humiriaceae	Humiriaceae sp.	–	x	–	–	NP11342	
Hypericaceae	*Vismia* sp.	–	–	–	x		
Icacinaceae	Icacinaceae sp.	–	x	–	–	NP11468	
Lamiaceae	*Vitex triflora*	–	–	–	x		
Lauraceae	*Aniba hypoglauca* cf.	–	–	x	–		
Lauraceae	*Aniba rosodora* cf.	–	x	–	–	NP11462	EN (IUCN)
Lauraceae	*Chlorocardium rodiei*	–	–	–	x		
Lauraceae	*Nectandra globosa*	–	–	–	x		
Lauraceae	*Ocotea argyrophylla*	x	x	–	x		
Lauraceae	*Ocotea discrepens*	–	–	–	x		
Lauraceae	*Ocotea gracilis* cf.	–	x	–	–	NP11473	
Lauraceae	*Ocotea guianensis*	x	x	–	–		
Lauraceae	*Ocotea* sp.	–	–	–	x		
Lauraceae	*Rhodostemonodaphne kunthiana*	–	–	–	x		
Lauraceae	Lauraceae spp. (not yet sorted)	x	x	x	–	NP11314, NP11315, NP11318, NP11323, NP11328, NP11331, NP11335, NP11380, NP11390, NP11396, NP11398, NP11400, NP11406, NP11408, NP11410, NP11418, NP11424, NP11459, NP11463, NP11503, NP11547, NP11548, NP11549, NP11550, NP11570, NP11637, NP11687	
Lecythidaceae	*Bertholletia excelsa*	x	x	x	–		VU (IUCN)
Lecythidaceae	*Couratari guianensis*	x	x	x	–		
Lecythidaceae	*Couratari oblongifolia*	–	–	–	x		
Lecythidaceae	*Eschweilera* "yellow"	x	x	x	–	NP11524, NP11525, NP11526, NP11527, NP11528, NP11529, NP11536, NP11538	
Lecythidaceae	*Eschweilera coriacea*	–	–	–	x		

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Lecythidaceae	*Eschweilera grandiflora* cf.	x	x	x	–	NP11385, NP11439, NP11532, NP11533, NP11534, NP11535, NP11537, NP11523	
Lecythidaceae	*Eschweilera micrantha*	–	–	–	x		
Lecythidaceae	*Eschweilera pedicellata*	–	–	–	x		
Lecythidaceae	*Eschweilera subglandulosa*	–	–	–	x		
Lecythidaceae	*Eschweilera* spp. (not yet sorted)	x	x	x	–	KH480, KH616, NP11324, NP11345, NP11347, NP11351, NP11366, NP11367, NP11518, NP11530, NP11531, NP11674, NP11690	
Lecythidaceae	*Gustavia hexapetala*	x	x	–	–		
Lecythidaceae	*Gustavia* sp.	x	x	–	–	KH494	
Lecythidaceae	*Lecythis* "red"	–	–	x	–	NP11519, NP11520, NP11521, NP11522, NP11523, NP11539, NP11652, NP11704, NP11706	
Lecythidaceae	*Lecythis corrugata*	x	x	–	–		
Lecythidaceae	*Lecythis zabucajo*	x	x	x	–		
Linaceae	*Roucheria columbiana*	x	–	x	–		
Linaceae	*Roucheria schomburgkii*	–	x	–	–		
Loganiaceae	*Strychnos guianensis*	–	–	–	x		
Loranthaceae	*Passovia* sp.	–	–	x	–	KH628	
Loranthaceae	*Struthanthus* sp.	–	–	x	–		
Loranthaceae	Loranthaceae sp.	–	–	x	–	KH585	
Malpighiaceae	*Byrsonima* sp.	–	x	–	–	NP11327, NP11391	
Malpighiaceae	*Heteropterys macrostachya*	–	–	–	x		
Malpighiaceae	*Hiraea faginea*	–	–	–	x		
Malpighiaceae	*Hiraea* sp.	–	–	x	–	KH631	
Malpighiaceae	*Mascagnia arenicola* cf.	–	–	x	–		
Malpighiaceae	*Tetrapterys crispa*	–	–	–	x		
Malpighiaceae	Malpighiaceae spp. (not yet sorted)	–	–	–	x		
Malvaceae	*Apeiba albiflora*	x	x	x	–		
Malvaceae	*Apeiba petoumo*	x	x	x	–		
Malvaceae	*Apeiba* sp.	–	–	x	–	NP11573	
Malvaceae	*Catostemma fragrans*	–	x	x	x	NP11388, NP11494	
Malvaceae	*Ceiba pentandra*	–	–	x	–		
Malvaceae	*Herrania* sp.	x	–	–	–		
Malvaceae	*Lueheopsis* sp.	x	x	x	–	NP11435	
Malvaceae	*Mollia glabrescens*	–	–	–	x		
Malvaceae	*Pachira flaviflora* cf.	x	–	–	–		
Malvaceae	*Pachira insignis*	x	x	–	–		
Malvaceae	*Sterculia* sp.	–	–	x	–	NP11551	
Malvaceae	*Theobroma subincanum*	–	x	x	x	NP11447	
Malvaceae	Malvaceae spp. (not yet sorted)	–	–	–	x		
Marantaceae	*Calathea* sp.	–	–	–	x		
Marantaceae	*Goeppertia altissima* cf.	–	x	x	–		

Vascular plants

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		Amuku	Monkey Jump	New River	UECC		
Marantaceae	*Goeppertia zingiberina*	–	–	–	x		
Marantaceae	*Goeppertia* sp.	–	–	x	–		
Marantaceae	*Ischnosiphon arouma*	x	x	–	x		
Marantaceae	*Ischnosiphon longiflorus*	x	x	x	–		
Marantaceae	*Ischnosiphon obliquus*	x	x	x	–		
Marantaceae	*Ischnosiphon* sp.	x	–	–	–	KH475	
Marantaceae	*Monotagma secundum*	–	–	–	x		
Marantaceae	*Monotagma spicatum*	–	–	–	x		
Marantaceae	*Monotagma* spp. (not yet sorted)	x	–	x	–	KH478, KH640	
Marcgraviaceae	*Norantea guianensis*	–	–	–	x		
Marcgraviaceae	*Souroubea guianensis*	–	x	x	x	KH579, KH644	
Melastomataceae	*Aciotis* sp.	–	–	–	x		
Melastomataceae	*Miconia poeppigii*	–	–	–	x		
Melastomataceae	*Miconia prasina*	–	–	–	x		
Melastomataceae	*Miconia pubipetala*	–	–	–	x		
Melastomataceae	*Miconia secundivaricata*	–	–	–	x		
Melastomataceae	*Miconia subciliata*	–	–	–	x		
Melastomataceae	*Miconia tococa*	x	x	x	–		
Melastomataceae	*Miconia tomentosa*	–	x	–	–		
Melastomataceae	*Miconia* spp. (not yet sorted)	x	x	x	–	KH514, KH552, KH560, KH567, KH570, NP11355	
Melastomataceae	*Mouriri duckeana*	x	x	–	–		
Melastomataceae	*Mouriri grandiflora*	–	–	–	x		
Melastomataceae	*Mouriri plasschaertii*	–	–	–	x		
Melastomataceae	*Mouriri* spp. (not yet sorted)	–	x	–	–	NP11413, NP11436	
Melastomataceae	*Ossaea* sp.	–	–	–	x		
Melastomataceae	Melastomataceae spp. (not yet sorted)	–	–	–	x		
Meliaceae	*Carapa guianensis*	x	x	x	x	NP11501	
Meliaceae	*Guarea kunthiana*	–	–	x	–	NP11505	
Meliaceae	*Guarea macrophylla*	x	x	x	x		
Meliaceae	*Guarea pubescens*	–	–	–	x		
Meliaceae	*Guarea silvatica* cf.	–	x	–	–	NP11411	
Meliaceae	*Guarea* spp. (not yet sorted)	–	x	x	x	KH580, KH645, NP11506, NP11507, NP11508, NP11509, NP11510, NP11541, NP11601, NP11602, NP11650	
Meliaceae	*Trichilia schomburgkii*	–	–	–	x		

LEGEND

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Appendix 1

Vascular plants

Family	Species	Campsite				Voucher specimen	Status
		Amuku	Monkey Jump	New River	UECC		
Meliaceae	*Trichilia septentrionalis*	x	x	–	–	NP11474	
Meliaceae	*Trichilia* spp. (not yet sorted)	–	x	x	x	NP11491	
Menispermaceae	*Abuta obovata* cf.	x	–	–	–	KH525	
Monimiaceae	*Mollinedia* sp.	–	–	–	x		
Monimiaceae	Monimiaceae spp. (not yet sorted)	–	–	–	x		
Moraceae	*Brosimum guianense*	–	–	x	x		
Moraceae	*Brosimum oligandrum*	–	–	x	–		
Moraceae	*Brosimum parinarioides*	x	x	x	–		
Moraceae	*Brosimum rubescens*	–	–	x	–		
Moraceae	*Clarisia racemosa*	–	x	–	–	NP11317, NP11420	
Moraceae	*Ficus catappifolia*	–	–	–	x		
Moraceae	*Helicostylis tomentosa*	–	–	–	x		
Moraceae	*Helicostylis* sp.	–	–	x	–	NP11516, NP11605	
Moraceae	*Maquira guianensis*	–	–	x	–	NP11517	
Moraceae	*Maquira sclerophylla*	x	x	x	–	NP11611	
Moraceae	*Perebea guianensis*	–	x	x	x	NP11513, NP11514, NP11571, NP11661, NP11686	
Moraceae	*Pseudolmedia laevigata*	–	x	x	–	NP11326, NP11379	
Moraceae	*Pseudolmedia laevis*	–	x	x	–	NP11693, NP11694	
Moraceae	*Sorocea pubivena*	x	x	x	–		
Moraceae	*Sorocea* sp.	–	–	x	–	NP11668	
Moraceae	Moraceae spp. (not yet sorted)	–	x	x	–	NP11365, NP11415, NP11515, NP11586, NP11615, NP11673, NP11679, NP11697	
Myristicaceae	*Iryanthera* "tall"	–	x	x	–	NP11558, NP11644	
Myristicaceae	*Iryanthera hostmannii* cf.	–	x	x	x	NP11409, NP11557	
Myristicaceae	*Iryanthera sagotiana*	–	–	–	x		
Myristicaceae	*Osteophloeum platyspermum*	x	x	–	–		
Myristicaceae	*Virola calophylla*	x	x	–	–	NP11442	
Myristicaceae	*Virola michelii*	–	x	x	–	NP11589	
Myristicaceae	*Virola surinamensis*	x	x	x	–		
Myristicaceae	*Virola* spp. (not yet sorted)	–	x	–	–	NP11321, NP11360	
Myristicaceae	Myristicaceae spp. (not yet sorted)	–	–	–	x		
Myrsinaceae	Myrsinaceae spp. (not yet sorted)	–	–	–	x		
Myrtaceae	*Calycolpus goetheanus*	x	x	–	–	KH524	
Myrtaceae	*Eugenia biflora* cf.	–	–	x	–		
Myrtaceae	*Eugenia lambertiana*	–	–	–	x		
Myrtaceae	*Eugenia omissa*	–	–	–	x		
Myrtaceae	*Eugenia* sp.	–	x	x	x	KH576, KH639	
Myrtaceae	*Myrcia grandis*	–	–	–	x		
Myrtaceae	*Myrcia subobliqua*	–	–	–	x		
Myrtaceae	*Myrcia* spp. (not yet sorted)	–	x	–	x	KH556, KH557, KH561, KH568, KH626, KH632	

Vascular plants

Family	Species	Campsite				Voucher specimen	Status
		Amuku	Monkey Jump	New River	UECC		
Myrtaceae	*Myrcianthes* sp.	–	–	–	x		
Myrtaceae	*Myrciaria vismiifolia*	–	–	–	x		
Myrtaceae	*Psidium acutangulum*	x	x	x	x	KH537, KH621, KH638	
Myrtaceae	Myrtaceae spp. (not yet sorted)	–	x	x	–	NP11472, NP11487, NP11493, NP11555, NP11572, NP11607, NP11641, NP11645, NP11657, NP11659, NP11676, NP11680	
Nyctaginaceae	*Neea* spp. (not yet sorted)	–	–	x	–	NP11483, NP11497	
Nymphaeaceae	*Nymphaea* sp.	–	–	–	x		
Ochnaceae	*Elvasia* sp.	–	–	–	x		
Ochnaceae	*Ouratea* sp. 1	–	x	–	–	NP11434	
Ochnaceae	*Ouratea* sp. 2	x	–	–	–	KH504	
Ochnaceae	*Quiina* sp.	–	–	x	–	NP11485	
Ochnaceae	*Touroulia guianensis*	x	x	x	–		
Olacaceae	*Chaunochiton kappleri*	x	x	x	–		
Olacaceae	*Dulacia guianensis*	–	x	–	–		
Olacaceae	*Minquartia guianensis*	x	x	x	–	NP11387, NP11575	
Olacaceae	Olacaceae sp. (not yet sorted)	–	x	–	–	NP11476	
Oleaceae	Oleaceae sp. (not yet sorted)	–	x	–	–		
Onagraceae	*Ludwigia latifolia*	–	–	–	x		
Onagraceae	*Ludwigia* sp.	–	–	x	–	KH596, KH651	
Orchidaceae	*Anathallis* sp.	–	–	–	x		
Orchidaceae	*Dichaea ancoraelabia*	–	–	–	x		II
Orchidaceae	*Epidendrum nocturnum*	–	–	–	x		
Orchidaceae	*Epidendrum rigidum*	–	–	–	x		II
Orchidaceae	*Maxillaria subrepens*	–	–	–	x		
Orchidaceae	*Maxillaria uncata*	–	–	–	x		
Orchidaceae	*Maxillaria* sp.	–	–	–	x		
Orchidaceae	*Microchilus reddeniae*	–	–	–	x		
Orchidaceae	*Orleanesia* sp.	–	–	–	x		
Orchidaceae	*Polystachya foliosa*	–	–	–	x		
Orchidaceae	*Prosthechea roraimensis*	–	–	–	x		II
Orchidaceae	*Scaphyglottis prolifera*	–	–	–	x		II
Orchidaceae	*Stanhopea grandiflora*	–	–	–	x		II
Orchidaceae	*Stelis* sp.	–	–	–	x		
Orchidaceae	*Vanilla pompona*	–	–	–	x		II

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Family	Species	Campsite				Voucher specimen	Status
		Amuku	Monkey Jump	New River	UECC		
Orchidaceae	*Wullschlaegelia calcarata*	–	–	–	x		II
Orchidaceae	Orchidaceae spp. (not yet sorted)	–	–	–	x		
Oxalidaceae	*Oxalis frutescens*	–	–	–	x		
Passifloraceae	*Passiflora costata* cf.	–	–	x	–	KH595	
Passifloraceae	*Passiflora glandulosa*	–	x	x	x	KH554, KH584	
Passifloraceae	*Passiflora leptopoda*	–	–	–	x		
Passifloraceae	*Passiflora riparia*	–	–	–	x		
Passifloraceae	*Passiflora securiclata*	–	–	–	x		
Passifloraceae	*Passiflora vespertilio*	–	–	–	x		
Passifloraceae	*Turnera* sp.	–	–	x	x	KH649	
Pentaphylacaceae	*Ternstroemia* sp.	–	x	–	–		
Phyllanthaceae	*Discocarpus essequeboensis*	x	x	–	–		
Phyllanthaceae	*Hieronyma oblonga*	x	x	–	–		
Phyllanthaceae	*Margaritaria* sp.	x	–	–	–	KH536	
Picramniaceae	*Picramnia* sp. 1	x	–	–	–	KH519	
Picramniaceae	*Picramnia* sp. 2	–	x	–	–		
Piperaceae	*Peperomia angustata*	–	–	–	x		
Piperaceae	*Peperomia delascioi*	–	–	–	x		
Piperaceae	*Peperomia obtusifolia*	–	–	–	x		
Piperaceae	*Peperomia* spp. (not yet sorted)	x	–	–	x	KH500	
Piperaceae	*Piper arboreum*	–	–	x	–		
Piperaceae	*Piper bartlingianum*	x	–	–	–	KH472	
Piperaceae	*Piper reticulatum*	–	–	x	–		
Piperaceae	*Piper* spp. (not yet sorted)	–	–	x	x	KH609	
Poaceae	*Axonopus longispicus*	–	–	–	x		
Poaceae	*Guadua latifolia* cf.	–	x	x	–		
Poaceae	*Ichnanthus dasycoleus*	–	–	–	x		
Poaceae	*Ichnanthus pallens*	–	–	–	x		
Poaceae	*Ichnanthus panicoides*	–	–	–	x		
Poaceae	*Merostachys* sp.	–	–	–	x		
Poaceae	*Olyra longifolia*	–	–	–	x		
Poaceae	*Pariana* sp.	x	x	–	–	KH501	
Poaceae	*Setaria parviflora*	–	–	–	x		
Poaceae	*Taquara micrantha* cf.	x	–	–	x	KH520	
Podostemaceae	*Apinagia longifolia*	x	–	–	–		
Podostemaceae	*Apinagia* sp.	x	–	–	–	KH517, KH549	
Podostemaceae	*Mourera fluviatilis*	x	x	x	–	KH491, KH624	
Podostemaceae	Podostemaceae spp. (not yet sorted)	–	–	–	x		
Polygalaceae	*Moutabea* sp.	–	–	–	x		
Polygalaceae	Polygalaceae spp. (not yet sorted)	–	–	–	x		
Polygalaceae	*Securidaca diversifolia*	–	–	–	x		
Polygalaceae	*Securidaca paniculata* cf.	–	–	x	–	KH598	

Vascular plants

Family	Species	Campsite				Voucher specimen	Status
		Amuku	Monkey Jump	New River	UECC		
Polygalaceae	*Securidaca uniflora*	–	–	–	x		
Polygonaceae	*Coccoloba* sp.	–	–	–	x		
Pontederiaceae	*Pontederia crassipes*	–	–	x	–		
Primulaceae	*Clavija* sp.	–	–	x	–	KH647	
Primulaceae	*Cybianthus* sp.	–	–	x	–	KH634	
Rapataceae	*Rapatea paludosa*	x	–	–	–	KH545	
Rhamnaceae	*Ampelozizyphus amazonicus*	x	x	–	–		
Rhamnaceae	*Gouania blanchetiana*	–	–	–	x		
Rhizophoraceae	*Cassipourea* sp.	x	–	–	–	KH515	
Rubiaceae	*Alibertia bertierifolia*	–	–	–	x		
Rubiaceae	*Alibertia* sp.	–	–	–	x		
Rubiaceae	*Amaioua* sp.	–	x	–	–	NP11414	
Rubiaceae	*Appunia peduncularis*	–	–	–	x		
Rubiaceae	*Bothriospora corymbosa*	–	–	–	x		
Rubiaceae	*Capirona macrophylla*	x	x	x	–	KH566	
Rubiaceae	*Chomelia obtusa*	–	–	–	x		
Rubiaceae	*Cordiera myrciifolia*	–	–	–	x		
Rubiaceae	*Coussarea violacea*	–	–	–	x		
Rubiaceae	*Diodia* sp.	x	–	–	–		
Rubiaceae	*Duroia aquatica*	–	–	x	–	NP11540	
Rubiaceae	*Duroia eriophylla* cf.	–	–	x	–	NP11577	
Rubiaceae	*Duroia* sp.	x	–	–	–	KH497, KH506	
Rubiaceae	*Eumachia astrellantha*	–	–	–	x		
Rubiaceae	*Eumachia podocephala*	–	–	–	x		
Rubiaceae	*Faramea irwinii*	–	–	–	x		
Rubiaceae	*Faramea* sp.	–	x	–	–	KH565	
Rubiaceae	*Genipa spruceana*	x	x	x	x	KH608	
Rubiaceae	*Guettarda* sp.	–	x	–	–	NP11428	
Rubiaceae	*Ixora ferrea*	–	–	–	x		
Rubiaceae	*Pagamea guianensis* cf.	x	–	–	–		
Rubiaceae	*Palicourea apoda*	–	–	–	x		
Rubiaceae	*Palicourea crocea*	–	–	–	x		
Rubiaceae	*Palicourea croceoides*	x	x	x	x		
Rubiaceae	*Palicourea justiciifolia*	x	x	–	x		
Rubiaceae	*Palicourea polycephala*	–	–	–	x		
Rubiaceae	*Palicourea suerrensis* cf.	x	x	–	–	KH495	
Rubiaceae	*Palicourea violacea*	–	–	–	x		

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		Amuku	Monkey Jump	New River	UECC		
Rubiaceae	*Palicourea* spp. (not yet sorted)	x	x	–	–	KH482, KH487,KH509, KH510, KH540, KH559, KH563, KH574	
Rubiaceae	*Posoqueria latifolia*	–	–	–	x		
Rubiaceae	*Posoqueria longiflora* cf.	–	–	x	–	KH623	
Rubiaceae	*Randia armata*	–	–	–	x		
Rubiaceae	*Rudgea cornifolia*	–	–	–	x		
Rubiaceae	*Rudgea crassiloba*	–	–	–	x		
Rubiaceae	*Sabicea oblongifolia*	–	–	–	x		
Rubiaceae	*Spermacoce ocymifolia*	–	–	–	x		
Rubiaceae	Rubiaceae spp. (not yet sorted)	–	–	x	–	NP11488	
Rutaceae	*Esenbeckia pilocarpoides* cf.	–	–	x	–		
Rutaceae	*Galipea davisii*	–	–	–	x		
Rutaceae	*Zanthoxylum* sp.	–	x	x	–		
Sabiaceae	Sabiaceae spp. (not yet sorted)	–	x	–	–		
Salicaceae	*Casearia bicolor*	x	x	x	–		
Salicaceae	*Casearia* sp.	–	x	–	x		
Salicaceae	*Piparea multiflora*	x	x	–	–	NP11312	
Salicaceae	*Ryania speciosa*	x	–	x	–	KH481, KH652	
Santalaceae	*Phoradendron* sp.	–	–	–	x		
Sapindaceae	*Cupania hirsuta*	–	x	–	–		
Sapindaceae	*Cupania macrostylis*	x	x	x	x		
Sapindaceae	*Cupania* sp.	–	–	x	–	NP11703	
Sapindaceae	*Matayba arborescens*	–	–	–	x		
Sapindaceae	*Matayba camptoneura*	–	–	–	x		
Sapindaceae	*Matayba purgans* cf.	–	x	–	–		
Sapindaceae	*Matayba* sp.	–	–	x	–	KH601	
Sapindaceae	*Paullinia dasygonia*	–	–	–	x		
Sapindaceae	*Talisia hemidasya*	–	–	x	–		
Sapindaceae	*Talisia mollis*	x	x	x	–		
Sapindaceae	*Urvillea ulmacea*	–	–	–	x		
Sapindaceae	Sapindaceae spp. (not yet sorted)	–	–	x	–	NP11482, NP11500, NP11608, NP11656, NP11705	
Sapotaceae	*Englerella macrocarpa*	–	–	–	x		
Sapotaceae	*Manilkara bidentata*	x	x	–	–		
Sapotaceae	*Manilkara* sp.	–	–	–	x		
Sapotaceae	*Micropholis guyanensis*	x	x	x	–	NP11362, NP11399, NP11425, NP11450, NP11585	
Sapotaceae	*Micropholis* sp.	–	–	–	x		
Sapotaceae	*Pouteria* "chica"	–	–	x	–	NP11596	
Sapotaceae	*Pouteria* "kakafu"	–	x	x	–	NP11338, NP11394, NP11410, NP11592, NP11593, NP11594	
Sapotaceae	*Pouteria ambelaniifolia*	–	x	–	–		
Sapotaceae	*Pouteria caimito*	–	–	–	x		
Sapotaceae	*Pouteria cladantha*	–	–	–	x		

Vascular plants

Family	Species	Campsite				Voucher specimen	Status
		Amuku	Monkey Jump	New River	UECC		
Sapotaceae	*Pouteria guianensis*	x	x	x	–	NP11445	
Sapotaceae	*Pouteria reticulata* aff.	–	–	x	–	NP11595	
Sapotaceae	*Pouteria torta* aff.	–	x	–	–	NP11422	
Sapotaceae	*Pouteria* spp. (not yet sorted)	–	x	–	x	NP11329, NP11353, NP11386, NP11426, NP11433, NP11446, NP11460, NP11467, NP11490, NP11597, NP11598, NP11599, NP11600, NP11664, NP11671, NP11672, NP11677	
Sapotaceae	*Pradosia verticillata*	–	–	–	x		
Sapotaceae	*Ragala sanguinolenta*	–	x	–	–	NP11447	
Sapotaceae	Sapotaceae spp. (not yet sorted)	–	–	–	x		
Simaroubaceae	*Homalolepis cedron*	–	–	x	–	NP11692	
Simaroubaceae	*Simaba* sp.	–	x	–	–	NP11397	
Simaroubaceae	*Simarouba amara*	x	x	x	–		
Simaroubaceae	Simaroubaceae spp. (not yet sorted)	–	–	–	x		
Siparunaceae	*Siparuna* "peluda"	–	–	x	–	NP11590, NP11649	
Siparunaceae	*Siparuna decipiens* cf.	–	–	x	–	NP11504, NP11698	
Smilacaceae	*Smilax* sp.	–	–	–	x		
Solanaceae	*Lycianthes pauciflora*	–	–	–	x		
Solanaceae	*Markea coccinea*	x	–	–	–	KH479	
Solanaceae	*Markea* sp.	–	–	–	x		
Solanaceae	*Solanum monachophyllum*	–	–	–	x		
Solanaceae	*Solanum schomburgkii*	–	–	–	x		
Solanaceae	*Solanum uncinellum*	–	–	–	x		
Stemonuraceae	*Discophora guianensis*	x	x	x	–		
Stemonuraceae	*Discophora* sp.	–	x	–	–	NP11559	
Strelitziaceae	*Phenakospermum guyannense*	x	x	x	x		
Trigoniaceae	*Trigonia hypoleuca*	–	–	–	x		
Triuridaceae	*Sciaphila picta*	–	–	–	x		
Urticaceae	*Cecropia latiloba*	–	–	–	x		
Urticaceae	*Cecropia obtusa*	x	x	x	–		
Urticaceae	*Cecropia sciadophylla*	x	–	x	–		
Urticaceae	*Cecropia silvae*	–	x	–	x		
Urticaceae	*Cecropia* spp. (not yet sorted)	x	x	x	–	NP11545	
Urticaceae	*Coussapoa trinervia*	x	–	–	–	KH486	
Urticaceae	*Pourouma* "3-lobed asperous"	–	x	x	–	NP11643	

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Family	Species	Campsite				Voucher specimen	Status
		Amuku	Monkey Jump	New River	UECC		
Urticaceae	*Pourouma* "5-lobed"	–	–	x	–	NP11502	
Urticaceae	*Pourouma guianensis* subsp. *guianensis*	–	–	–	x		
Urticaceae	*Pourouma melinonii* subsp. *melinonii*	–	–	–	x		
Urticaceae	*Pourouma minor*	–	x	x	x	NP11382, NP11588	
Urticaceae	*Pourouma tomentosa* subsp. *maroniensis*	–	–	–	x		
Verbenaceae	*Petrea macrostachya*	–	–	–	x		
Violaceae	*Leonia glycycarpa*	–	x	x	–	NP11691	
Violaceae	*Paypayrola longifolia*	x	x	x	–	KH473, KH578	
Violaceae	*Paypayrola/Amphirox* sp.	–	–	x	x	NP11492	
Violaceae	*Rinorea flavescens*	–	x	–	–		
Violaceae	*Rinorea* spp. (not yet sorted)	x	x	x	x	KH476, KH523, KH569, KH648, NP11403	
Violaceae	Violaceae spp. (not yet sorted)	–	–	–	x		
Vitaceae	*Cissus alata*	–	–	–	x		
Vitaceae	*Cissus verticillata* cf.	–	–	x	–	KH593	
Vitaceae	*Cissus* sp.	–	–	–	x		
Vochysiaceae	*Ruizterania albiflora* cf.	x	x	–	–	NP11311, NP11340	
Vochysiaceae	*Ruizterania* sp.	x	x	x	–		
Vochysiaceae	*Vochysia guianensis*	–	–	–	x		
Vochysiaceae	*Vochysia* spp. (not yet sorted)	–	–	x	x	KH604	
Zingiberaceae	*Renealmia floribunda*	–	–	–	x		
Zingiberaceae	*Renealmia* sp.	x	x	–	–		
Unidentified angiosperm	Unidentified spp. (not yet sorted)	x	x	x	x	NP11375, NP11377, NP11419, NP11421, NP11461, NP11466, NP11635	
Pteridophyta (Aspleniaceae)	*Asplenium angustum*	–	–	–	x		
Pteridophyta (Aspleniaceae)	*Asplenium salicifolium*	–	–	–	x		
Pteridophyta (Aspleniaceae)	*Asplenium serratum*	–	–	–	x		
Pteridophyta (Hymenophyllaceae)	*Hymenophyllum* sp.	x	–	–	–	KH546	
Pteridophyta (Hymenophyllaceae)	*Trichomanes crispum*	–	–	–	x		
Pteridophyta (Hymenophyllaceae)	*Trichomanes cristatum* cf.	x	x	–	–		
Pteridophyta (Hymenophyllaceae)	*Trichomanes pedicellatum*	–	–	–	x		
Pteridophyta (Hymenophyllaceae)	*Trichomanes pinnatum* cf.	x	x	x	x		
Pteridophyta (Hymenophyllaceae)	*Trichomanes vittaria*	–	–	–	x		

Vascular plants

Family	Species	Campsite				Voucher specimen	Status
		Amuku	Monkey Jump	New River	UECC		
Pteridophyta (Lindsaeaceae)	*Lindsaea lancea* var. *lancea*	–	–	–	x		
Pteridophyta (Lindsaeaceae)	*Lindsaea* sp.	x	–	–	–		
Pteridophyta (Metaxyaceae)	*Metaxya parkeri* cf.	–	x	–	–	KH571	
Pteridophyta (Metaxyaceae)	*Metaxya rostrata*	–	–	–	x		
Pteridophyta (Nephrolepidaceae)	*Nephrolepis rivularis*	–	–	–	x		
Pteridophyta (Polypodiaceae)	*Campyloneurum* sp.	–	x	–	–		
Pteridophyta (Polypodiaceae)	*Microgramma lycopodioides*	–	–	–	x		
Pteridophyta (Polypodiaceae)	*Microgramma percussa*	–	–	–	x		
Pteridophyta (Polypodiaceae)	*Microgramma reptans*	–	–	–	x		
Pteridophyta (Polypodiaceae)	*Microgramma thurnii*	–	–	–	x		
Pteridophyta (Polypodiaceae)	*Niphidium crassifolium*	–	–	–	x		
Pteridophyta (Polypodiaceae)	*Pecluma plumula*	–	–	–	x		
Pteridophyta (Polypodiaceae)	*Pleopeltis burchellii*	–	–	–	x		
Pteridophyta (Polypodiaceae)	*Pleopeltis desvauxii*	–	–	–	x		
Pteridophyta (Polypodiaceae)	*Pleopeltis polypodioides*	–	–	–	x		
Pteridophyta (Pteridaceae)	*Adiantum adiantoides*	–	–	–	x		
Pteridophyta (Pteridaceae)	*Adiantum cajennense* cf.	x	–	–	–	KH532	
Pteridophyta (Pteridaceae)	*Adiantum glaucescens*	–	–	–	x		
Pteridophyta (Pteridaceae)	*Adiantum olivaceum*	–	–	–	x		
Pteridophyta (Pteridaceae)	*Adiantum petiolatum*	–	–	–	x		
Pteridophyta (Pteridaceae)	*Adiantum* sp.	x	–	–	–	KH547	

LEGEND

Vouchers

KH = Kaslyn Holder-Collins

NP = Nigel Pitman

Status

CR (Guyana) = Critically Endangered in Guyana

CR (IUCN) = Globally Critically Endangered

EN (IUCN) = Globally Endangered

II = CITES Appendix II

NR = New record for Guyana

NT (IUCN) = Globally Near Threatened

VU (IUCN) = Globally Vulnerable

Appendix 1

Family	Species	Campsite				Voucher specimen	Status
		Amuku	Monkey Jump	New River	UECC		
Pteridophyta (Pteridaceae)	*Polytaenium guayanense*	–	–	–	x		
Pteridophyta (Pteridaceae)	*Hecistopteris pumila*	–	–	–	x		
Pteridophyta (Pteridaceae)	*Vittaria lineata*	–	–	–	x		
Pteridophyta (Schizaeaceae)	*Anemia villosa*	–	–	–	x		
Pteridophyta (Schizaeaceae)	*Schizaea fluminensis*	–	–	–	x		
Pteridophyta (Selaginellaceae)	*Selaginella conduplicata*	x	x	x	x	KH471, KH558	
Pteridophyta (Tectariaceae)	*Triplophyllum funestum*	–	–	–	x		
Pteridophyta (Thelypteridaceae)	*Thelypteris opulenta*	–	–	–	x		
Pteridophyta	Pteridophyta sp.	x	–	–	–	KH477	

Vascular plants

LEGEND

Vouchers

KH = Kaslyn Holder-Collins
NP = Nigel Pitman

Status

CR (Guyana) = Critically Endangered in Guyana
CR (IUCN) = Globally Critically Endangered
EN (IUCN) = Globally Endangered
II = CITES Appendix II
NR = New record for Guyana
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Fish sampling stations

Main attributes of the fish sampling stations visited during a rapid inventory of the Acarai-Corentyne Corridor of Guyana, on 5–24 November 2024, by Lesley de Souza, Donald Taphorn, Devya Hemraj, Allister Henry, and Onesimus Rudolph. All stations were in main rivers and their tributaries with black or mixed (black with a higher sediment load) water, and all stations featured well-preserved riparian forest and a substrate of leaf litter and woody debris. Several sites consisted of rapids with aquatic vegetation.

Campsite	Station number	Station name	Date	Watershed
Amuku	GUY24C1-01	Creek on trail N	6-Nov-24	Essequibo
	GUY24C1-02	Inlet on upper Essequibo River	7-Nov-24	Essequibo
	GUY24C1-03	Near mouth of Amuku creek on Essequibo River	7-Nov-24	Essequibo
	GUY24C1-04	Anteater Falls on Essequibo River	7-Nov-24	Essequibo
	GUY24C1-05	Creek on trail F	7-Nov-24	Essequibo
	GUY24C1-06	Essequibo River between mouth of Amuku Creek	7-Nov-24	Essequibo
	GUY24C1-07	Anteater Falls on Essequibo River	7-Nov-24	Essequibo
	GUY24C1-08	Puddle on trail P	7-Nov-24	Essequibo
	GUY24C1-09	Amuku creek upstream from mouth	8-Nov-24	Essequibo
	GUY24C1-10	Essequibo River at mouth of Amuku Creek	8-Nov-24	Essequibo
	GUY24C1-11	Anteater Falls on Essequibo River	8-Nov-24	Essequibo
	GUY24C1-12	Stream near Amuku mountain satellite camp	8-Nov-24	Essequibo
	GUY24C1-13	Essequibo River below Anteater Falls	9-Nov-24	Essequibo
	GUY24C1-14	Sand beach on Kassikaityu River	9-Nov-24	Essequibo
	GUY24C1-15	Stream on main trail	9-Nov-24	Essequibo
	GUY24C1-16	Creek on main trail at satellite camp	10-Nov-24	Essequibo
	GUY24C1-17	Dock on Essequibo River	10-Nov-24	Essequibo
Monkey Jump	GUY24C2-18	Yiuxra inlet on Essequibo River	12-Nov-24	Essequibo
	GUY24C2-19	Creek downriver from camp	12-Nov-24	Essequibo
	GUY24C2-20	Headwater creek of New River, 16km from main camp	13-Nov-24	New River
	GUY24C2-21	Monkey Jump creek off a trail	13-Nov-24	Essequibo
	GUY24C2-22	Essequibo River sand beach	13-Nov-24	Essequibo
	GUY24C2-23	Essequibo River	14-Nov-24	Essequibo
	GUY24C2-24	Essequibo River	15-Nov-24	Essequibo
	GUY24C2-25	Essequibo River sand beach	15-Nov-24	Essequibo
New River	GUY24C3-26	Rapids on New River	17-Nov-24	New River
	GUY24C3-27	Rapids on New River near Camp Jaguar airstrip	17-Nov-24	New River
	GUY24C3-28	Isolated pool in mainsteam of New River braided network	19-Nov-24	New River
	GUY24C3-29	New River stream on trail 3	19-Nov-24	New River
	GUY24C3-30	Andira Falls facing Cashew Island community	19-Nov-24	New River
	GUY24C3-31	Channel of New River	21-Nov-24	New River
	GUY24C3-32	Barrington Brown River at falls	21-Nov-24	New River
	GUY24C3-33	New River	21-Nov-24	New River
	GUY24C3-34	Rapids on New River	22-Nov-24	New River
	GUY24C3-35	Rapids on New River	23-Nov-24	New River

Fish sampling stations

	Region	Latitude	Longitude	Habitat	Substrate type
	Region 9	01° 50’ 20.90” N	058° 31’ 32.28” W	lentic	woody debris, sand, leaf litter
	Region 9	01° 48’ 30.17” N	058° 33’ 08.33” W	lotic	woody debris, sand, leaf litter
	Region 9	01° 48’ 39.47” N	058° 32’ 45.10” W	lotic	sand
	Region 9	01° 49’ 40.35” N	058° 32’ 39.25” W	lotic	rocks, sand, gravel, vegetation
	Region 9	01° 48’ 35.77” N	058° 32’ 14.02” W	lotic	woody debris, sand, leaf litter
	Region 9	01° 49’ 21.64” N	058° 46’45.25” W	lotic	sand, woody debris
	Region 9	01° 49’ 40.35” N	058° 32’ 39.25” W	lotic	rocks, sand, gravel, vegetation
	Region 9	01° 50’ 19.25” N	058° 30’ 45.78” W	lentic	woody debris, sand, leaf litter
	Region 9	01° 48’ 28.32” N	058° 32’ 38.78” W	lotic	woody debris, sand, leaf litter
	Region 9	01° 48’ 40.57” N	058° 32’ 44.42” W	lotic	woody debris, sand, leaf litter
	Region 9	01° 49’ 40.35” N	058° 32’ 39.25” W	lotic	rocks, sand, gravel, vegetation
	Region 9	01° 49’ 18.12” N	058° 28’ 17.40” W	lotic	woody debris, sand, leaf litter
	Region 9	01° 49’ 46.72” N	058° 32’ 40.82” W	lotic	rocks, sand, gravel, vegetation
	Region 9	01° 49’ 44.51” N	058° 32’ 33.35” W	lotic	sand
	Region 9	01° 49’ 3.26” N	058° 28’ 52.59” W	lotic	woody debris, sand, leaf litter
	Region 9	01° 49’ 13.62” N	058° 23’ 44.50” W	lentic	woody debris, sand, leaf litter
	Region 9	01° 49’ 36.79” N	058° 32’ 34.02” W	lotic	sand, gravel
	Region 9	02° 07’ 24.77” N	058° 20’ 14.38” W	lotic	woody debris, sand, leaf litter
	Region 9	02° 08’ 23.68” N	058° 17’ 41.21” W	lotic	woody debris, sand, leaf litter
	Region 6	02° 5’ 13.36” N	058° 11’ 49.71” W	lotic	woody debris, sand, leaf litter
	Region 9	02° 6’ 46.98” N	058° 18’ 50.02” W	lotic	woody debris, sand, leaf litter
	Region 9	02° 9’ 14.89” N	058° 17’ 19.98” W	lotic	sand, gravel
	Region 9	02° 7’ 3.23” N	058° 20’ 24.42” W	lotic	sand, gravel
	Region 9	02° 9’ 42.32” N	058° 16’ 33.62” W	lotic	sand, gravel
	Region 9	02° 9’ 2.01” N	058° 17’ 39.46” W	lotic	sand, gravel, woody debris
	Region 6	03° 19’ 07.80” N	057° 36’ 35.29” W	lotic	rocks, vegetation, gravel, sand
	Region 6	03° 18’ 22.67” N	057° 35’ 49.97” W	lotic	rocks, sand, gravel, vegetation
	Region 6	03° 18’ 01.38” N	057° 36’ 46.68” W	lotic	rocks, sand, gravel
	Region 6	03° 18’ 01.38” N	057° 36’ 46.68” W	lotic	rocks, sand, gravel
	Region 6	03° 16’ 32.86” N	057° 35’ 54.99” W	lotic	rocks, sand, gravel
	Region 6	03° 19’ 12.50” N	057° 36’ 49.37” W	lotic	rocks, sand, gravel, vegetation
	Region 6	03° 18’ 46.36” N	057° 37’ 53.01” W	lotic	rocks, sand, gravel, vegetation
	Region 6	03° 11’ 25.10” N	057° 37 35.89” W	lotic	rocks, sand, gravel, vegetation
	Region 6	03° 20’ 10.74” N	057° 36’ 18.47” W	lotic	rocks, sand, gravel
	Region 6	03° 19’ 20.97” N	057° 36’ 48.03” W	lotic	rocks, sand, gravel

Fishes

Fishes recorded by Lesley de Souza, Donald Taphorn, Devya Hemraj, Allister Henry, and Onesimus Rudolph during a rapid inventory of the Acarai-Corentyne Corridor of Guyana on 5–24 November 2024. The checklist also includes species recorded by Philip Willink, Eustace Alexander, and Christopher Jones during a September 2007 expedition to the now-defunct Upper Essequibo Conservation Concession, which is inside the Acarai-Corentyne Corridor. For more details on that dataset see Willink et al. (2013). For fish taxa only recorded by environmental DNA, see Appendix 8.

Scientific name	Name in Waiwai	Number of individuals recorded in the RI32 campsites			Species recorded in Northern Lowland Essequibo (Willink et al. 2013)	Total number of individuals	
		Amuku	Monkey Jump	New River			
ACANTHURIFORMES							
Sciaenidae							
Petilipinnis grunniens		3	4	1	0	8	
BELONIFORMES							
Belonidae							
Potamorrhaphis guianensis		–	–	–	1	0	
CHARACIFORMES							
Acestrorhamphidae							
Acestrorhamphidae spp.		–	–	2	0	2	
Astyanax bimaculatus		–	–	–	1	0	
Brachychalcinus orbicularis		14	24	6	0	44	
Hemigrammus analis		–	–	–	1	0	
Hemigrammus bellottii		2	4	–	0	6	
Hemigrammus cf. *boesemani*		–	–	–	1	0	
Hemigrammus collettii		–	–	–	1	0	
Hemigrammus copei		113	24	19	0	156	
Hemigrammus cylindricus		–	–	–	1	0	
Hemigrammus cf. *elegans*		–	–	3	0	3	
Hemigrammus erythrozonus		–	–	–	1	0	
Hemigrammus orthus		32	–	–	0	32	
Hemigrammus cf. *orthus*		1	–	2	0	3	
Hemigrammus unilineatus		–	–	–	1	0	
Hemigrammus sp.		4	–	23	0	27	
Holopristis ocellifera		7	10	1	1	18	
Hyphessobrycon minor		3	12	–	1	15	
Jupiaba abramoides		7	–	102	1	109	
Jupiaba cf. *maroniensis*		–	–	24	0	24	
Jupiaba pinnata		6	–	20	0	26	
Jupiaba polylepis		98	148	63	1	309	
Makunaima guianensis		–	–	–	1	0	
Megalamphodus rosaceus		–	–	26	1	26	
Moenkhausia chrysargyrea		–	–	–	1	0	
Moenkhausia comma		–	1	–	0	1	
Moenkhausia cotinho		–	–	–	1	0	
Moenkhausia cf. *dichoura*		–	–	5	0	5	

Appendix 3

Fishes

LEGEND

Conservation status (IUCN 2024)

DD = Data Deficient

LC = Least Concern

NL = Not Listed

Record type

col = Specimen collected

obs = Observed in the field

ref = Recorded by Willink et al. (2013)

Uses

FF = Food fish

OR = Ornamental

GF = Game fish

	Conservation status (IUCN 2024)	New records Guyana	Potential new species	Record type	Uses
	LC	0	0	ref	FF
	LC	0	0	ref	–
	LC	0	0	col	–
	LC	0	0	ref	–
	LC	0	0	col	–
	LC	0	0	ref	OR
	LC	0	0	col	OR
	LC	0	0	ref	OR
	LC	0	0	col	OR
	DD	0	0	col	OR
	LC	0	0	ref	OR
	DD	1	1	col	OR
	LC	0	0	ref	OR
	LC	0	0	col	OR
	LC	0	0	col	OR
	LC	0	0	ref	OR
	LC	0	0	col	OR
	LC	0	0	col	OR
	LC	0	0	col	OR
	LC	0	0	col	–
	LC	0	0	col	–
	LC	0	0	col	–
	LC	0	0	col	–
	LC	0	0	ref	–
	LC	0	0	col + ref	OR
	LC	0	0	ref	–
	LC	0	0	col	–
	LC	0	0	ref	–
	LC	0	1	col	–

Appendix 3

Fishes

Scientific name	Name in Waiwai	Number of individuals recorded in the RI32 campsites			Species recorded in Northern Lowland Essequibo (Willink et al. 2013)	Total number of individuals
		Amuku	Monkey Jump	New River		
Moenkhausia grandisquamis		–	–	121	0	121
Moenkhausia hemigrammoides		–	–	–	1	0
Moenkhausia cf. *icae*		–	–	–	1	0
Moenkhausia cf. *inrai*		–	–	–	1	0
Moenkhausia cf. *intermedia*		–	–	1	0	1
Moenkhausia cf. *intermedia*		4	–	–	0	4
Moenkhausia jamesi		–	–	4	0	4
Moenkhausia cf. *lepidura*		53	233	2	1	288
Moenkhausia megalops		–	3	–	0	3
Moenkhausia oligolepis		10	3	3	1	16
Moenkhausia cf. *surinamensis*		–	–	2	0	2
Moenkhausia sp.		–	–	1	0	1
Poptella compressa		–	–	–	1	0
Poptella longipinnis		4	–	6	0	10
Acestrorhynchidae						
Acestrorhynchus falcatus	Ipiko	1	4	–	0	5
Acestrorhynchus falcirostris	Ipiko	1	–	–	0	1
Acestrorhynchus microlepis	Ipiko	1	7	2	1	10
Heterocharax macrolepis		–	–	–	1	0
Anostomidae						
Anostomus anostomus	Okoimomanatiri	2	11	4	0	17
Anostomus ternetzi		–	–	–	1	0
Hypomasticus megalepis		6	–	11	0	17
Leporinus agassizii		–	5	–	0	5
Leporinus apollo		–	–	1	0	1
Leporinus arcus		1	–	4	0	5
Leporinus fasciatus		–	–	3	1	3
Leporinus cf. *fasciatus*		1	2	1	0	4
Leporinus cf. *frederici*		–	–	7	0	7
Leporinus granti		–	–	4	0	4
Leporinus maculatus		2	–	27	1	29
Leporinus nigrotaeniatus		1	–	–	1	1
Leporinus nijsseni		–	–	2	0	2
Leporinus ortomaculatus		–	7	30	0	37
Petulanos plicatus		–	–	3	0	3
Bryconidae						
Brycon falcatus	Puxa	2	10	2	1	14
Brycon cf. *pesu*		1	2	–	1	3
Chalceidae						
Chalceus macrolepidotus	Kunurima	2	1	–	1	3

Appendix 3

Fishes

	Conservation status (IUCN 2024)	New records Guyana	Potential new species	Record type	Uses
	LC	1	0	col	–
	LC	0	0	ref	–
	LC	0	0	ref	–
	LC	0	0	ref	–
	LC	0	1	col	–
	LC	0	1	col	–
	LC	0	0	col	–
	LC	0	1	col + ref	OR
	LC	0	0	col	–
	LC	0	0	col	OR
	LC	1	0	col	–
	LC	0	0	col	OR
	LC	0	0	ref	OR
	LC	0	0	col	OR
	LC	0	0	col	–
	LC	0	0	col	–
	LC	0	0	col	–
	LC	0	0	ref	–
	LC	0	0	col	OR
	LC	0	0	ref	OR
	LC	0	0	col	OR
	LC	0	0	col	FF
	LC	1	0	col	FF
	LC	0	0	col	FF, OR
	LC	0	0	col	–
	LC	0	1	col	FF
	LC	0	1	col	FF
	LC	0	0	col	OR
	LC	0	0	col	OR
	LC	0	0	ref	OR
	LC	1	0	col	OR
	LC	0	0	col	OR
	LC	0	0	col	OR
	LC	0	0	col	FF
	LC	0	1	col	FF
	LC	0	0	col	OR, FF

LEGEND

Conservation status (IUCN 2024)

DD = Data Deficient

LC = Least Concern

NL = Not Listed

Record type

col = Specimen collected

obs = Observed in the field

ref = Recorded by Willink et al. (2013)

Uses

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Appendix 3

Fishes

Scientific name	Name in Waiwai	Number of individuals recorded in the RI32 campsites			Species recorded in Northern Lowland Essequibo (Willink et al. 2013)	Total number of individuals
		Amuku	Monkey Jump	New River		
Characidae						
Aphyocharax erythurus		–	–	–	1	0
Charax gibbosus		–	3	–	0	3
Charax hemigrammus		–	–	–	1	0
Cynopotamus essequibensis		–	3	–	1	3
Phenacogaster carteri		–	–	5	0	5
Phenacogaster megalostictus		–	–	60	0	60
Phenacogaster microstictus		–	1	–	1	1
Tetragonopterus argenteus	Kutakru	1	–	–	0	1
Tetragonopterus chalceus	Kutakru	2	13	4	1	19
Tetragonopterus georgiae	Kutakru	–	–	199	0	199
Tetragonopterus rarus	Kutakru	–	–	74	0	74
Tetragonopterus sp.	Kutakru	2	–	–	0	2
Chilodontidae						
Caenotropus maculosus		–	–	161	1	161
Chilodus punctatus		–	–	–	1	0
Crenuchidae						
Characidium crandelli		3	–	–	0	3
Characidium pteroides		–	–	–	1	0
Characidium steindachneri		–	–	–	1	0
Characidium zebra		8	1	8	0	17
Crenuchus spilurus		–	–	–	1	0
Melanocharacidium cf. *dispilomma*		1	1	–	0	2
Curimatidae						
Curimatella immaculata		2	–	–	0	2
Curimatopsis crypticus		–	3	5	1	8
Cyphocharax helleri	Kururu	1	3	–	0	4
Cyphocharax spilurus		26	40	162	1	228
Psectrogaster essequibensis		–	1	–	1	1
Steindachnerina guentheri		1	–	–	0	1
Cynodontidae						
Cynodon septenarius		1	–	–	0	1
Hydrolycus armatus		–	–	–	1	0
Erythrinidae						
Hoplerythrinus unitaeniatus		14	–	–	0	14
Hoplias aimara	Aimara	4	–	–	1	4
Hoplias curupira		–	–	1	0	1
Hoplias malabaricus	Aimara	6	–	17	1	23
Gasteropelecidae						
Carnegiella strigata		–	–	–	1	0

Fishes

	Conservation status (IUCN 2024)	New records Guyana	Potential new species	Record type	Uses
	LC	0	0	ref	OR
	LC	0	0	col	–
	LC	0	0	ref	–
	LC	0	0	col	–
	LC	0	0	col	–
	LC	0	0	col	–
	LC	0	0	col	–
	LC	0	0	col	OR
	LC	0	0	col	–
	LC	0	0	col	–
	LC	0	0	col	–
	LC	0	0	col	–
	LC	0	0	col	OR
	LC	0	0	ref	OR
	LC	0	0	col	OR
	LC	0	0	ref	OR
	LC	0	0	ref	OR
	LC	0	0	col	OR
	LC	0	0	ref	OR
	LC	0	1	col	OR
	LC	0	0	col	–
	LC	0	0	col	–
	LC	0	0	col	OR
	LC	0	0	col	–
	LC	0	0	col	FF
	LC	0	0	col	OR
	LC	0	0	col	FF, GF
	LC	0	0	ref	FF, GF
	LC	0	0	col	FF
	LC	0	0	col	FF, GF
	LC	0	0	col	FF
	LC	0	0	col	FF
	LC	0	0	ref	OR

LEGEND

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Appendix 3

Fishes

Scientific name	Name in Waiwai	Number of individuals recorded in the RI32 campsites			Species recorded in Northern Lowland Essequibo (Willink et al. 2013)	Total number of individuals
		Amuku	Monkey Jump	New River		
Hemiodontidae						
Argonectes longiceps		13	–	–	0	13
Bivibranchia bimaculata		–	–	29	0	29
Bivibranchia fowleri		2	58	–	0	60
Hemiodus cf. *goeldii*		–	1	–	0	1
Hemiodus cf. *microlepis*		–	1	–	0	1
Hemiodus quadrimaculatus		32	3	25	0	60
Hemiodus cf. *semitaeniatus*		–	1	–	0	1
Hemiodus cf. *ternetzi*		2	1	–	0	3
Hemiodus cf. *thayeria*		–	1	–	0	1
Hemiodus unimaculatus	Yaawa	1	3	2	1	6
Iguanodectidae						
Bryconops affinis		–	4	–	0	4
Bryconops caudomaculatus		14	42	10	1	66
Bryconops melanurus		–	–	2	0	2
Bryconops sp. Redtail		–	–	55	0	55
Lebiasinidae						
Nannostomus marginatus		1	1	3	1	5
Nannostomus unifasciatus		–	–	–	1	0
Pyrrhulina filamentosa		–	1	–	0	1
Pyrrhulina stoli		6	3	1	1	10
Parodontidae						
Parodon guyanensis		11	–	10	1	21
Prochilodontidae						
Prochilodus rubrotaeniatus		–	–	2	0	2
Serrasalmidae						
Myleus pacu		–	–	–	1	0
Myleus setiger		–	16	2	0	18
Myloplus asterias		–	2	–	0	2
Myloplus rubripinnis		–	–	2	0	2
Myloplus sp.		–	–	5	0	5
Prosomyleus rhomboidalis		1	–	7	0	8
Serrasalmus calmoni		–	–	–	1	0
Serrasalmus rhombeus	Ponitko (normal colours; Poone (black colour)	2	16	4	1	22
Stevardiidae						
Bryconamericus hyphesson		5	5	14	1	24
Triportheidae						
Agoniates halecinus		–	–	–	1	0
Triportheus brachipomus	Exepapa	–	–	7	0	7

Fishes

	Conservation status (IUCN 2024)	New records Guyana	Potential new species	Record type	Uses
	LC	0	0	col	–
	LC	1	0	col	–
	LC	0	0	col	–
	LC	0	1	col	OR
	LC	0	1	col	OR
	LC	0	0	col	OR
	LC	0	1	col	OR
	LC	0	1	col	OR
	LC	0	1	col	OR
	LC	0	0	col	OR
	LC	0	0	col	–
	LC	0	0	col	OR
	NL	0	0	col	OR
	NL	1	1	col	OR
	LC	0	0	col	OR
	LC	0	0	ref	OR
	LC	0	0	col	OR
	LC	0	0	col	OR
	NL	0	0	col	OR
	LC	0	0	col	FF
	NT	0	0	ref	FF, GF
	LC	0	0	col	FF, GF
	LC	0	0	col	FF, GF
	LC	0	0	col	FF, OR
	LC	0	0	col	FF, OR
	LC	0	0	col	FF
	LC	0	0	ref	FF
	LC	0	0	col	FF, GF
	LC	0	0	col	–
	LC	0	0	ref	–
	LC	0	0	col	–

LEGEND

Conservation status (IUCN 2024)

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Record type

col = Specimen collected

obs = Observed in the field

ref = Recorded by Willink et al. (2013)

Uses

FF = Food fish

OR = Ornamental

GF = Game fish

Appendix 3

Fishes

Scientific name	Name in Waiwai	Number of individuals recorded in the RI32 campsites			Species recorded in Northern Lowland Essequibo (Willink et al. 2013)	Total number of individuals
		Amuku	Monkey Jump	New River		
CICHLIFORMES						
Cichlidae						
Aequidens tetramerus		10	–	–	0	10
Apistogramma cf. *ortmanni*		8	3	4	1	15
Apistogramma steindachneri		–	–	–	1	0
Biotodoma aff. *cupido*		–	–	–	1	0
Chaetobrachus flavescens		–	–	–	1	0
Cichla ocellaris		3	–	–	1	3
Cichla cf. *ocellaris*		–	–	1	0	1
Geophagus cf. *surinamensis*	Xakarakara	–	–	20	0	20
Geophagus cf. *surinamensis*	Xakarakara	4	8	4	0	16
Guianacara dacrya	Tirpo	51	78	–	1	129
Guianacara sphenozona	Tirpo	–	–	39	0	39
Krobia cf. *guianensis*		–	–	1	0	1
Lugubria cf. *lenticulata*	Xurwata	1	2	–	0	3
Lugubria cf. *lugubris*	Xurwata	2	1	–	0	3
Satanoperca leucostica		–	–	–	1	0
Saxatilia alta		5	1	–	1	6
Saxatilia saxatilis		6	–	–	0	6
Saxatilia sipaliwini		–	–	16	0	16
Wallaciia wallacii		–	–	–	1	0
Engraulidae						
Anchoviella cf. *jamesi*		–	–	–	1	0
CYPRINIDONTIFORMES						
Rivulidae						
Laimosemion cf. *mabura*		–	–	–	1	0
GYMNOTIFORMES						
Apteronotidae						
Apteronotus albifrons		–	1	17	0	18
Gymnotidae						
Electrophorus electricus		–	1	–	1	1
Gymnotus carapo		5	–	–	0	5
Gymnotus coropinae		2	–	–	0	2
Hypopomidae						
Brachyhypopomus brevirostris		10	–	–	1	10
Brachyhypopomus pinnicaudatus		–	–	–	1	0
Hypopomus artedi		–	–	3	0	3
Hypopygus lepturus		–	–	–	1	0
Sternopygidae						
Eigenmannia cf. *macuxi*	Kaso	–	–	11	0	11
Eigenmannia cf. *sayona*	Kaso	–	–	1	0	1

Fishes

	Conservation status (IUCN 2024)	New records Guyana	Potential new species	Record type	Uses
	LC	0	0	col	OR
	LC	0	1	col	OR
	NL	0	0	ref	OR
	LC	0	0	ref	OR
	LC	0	0	ref	OR
	LC	0	0	col	FF, GF
	LC	0	1	col	FF, GF
	LC	0	1	col	FF, OR
	LC	0	1	col	FF, OR
	LC	0	0	col	OR
	LC	1	0	col	OR
	LC	0	1	col	OR
	LC	0	1	col	FF, OR
	LC	0	1	col	FF, OR
	LC	0	0	ref	FF, OR
	LC	0	0	col	FF, OR
	LC	0	0	col	FF, OR
	LC	1	0	col	FF, OR
	LC	0	0	ref	OR
	LC	0	0	ref	–
	LC	0	1	ref	–
	LC	0	0	col	OR
	LC	0	0	col	–
	LC	0	0	col	–
	LC	0	0	col	–
	LC	0	0	ref	–
	LC	1	0	ref	–
	LC	0	0	col	–
	LC	0	0	ref	–
	LC	0	1	col	–
	LC	1	1	col	–

LEGEND

Conservation status (IUCN 2024)

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Record type

col = Specimen collected

obs = Observed in the field

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Uses

FF = Food fish

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Appendix 3

Fishes

Scientific name	Name in Waiwai	Number of individuals recorded in the RI32 campsites			Species recorded in Northern Lowland Essequibo (Willink et al. 2013)	Total number of individuals
		Amuku	Monkey Jump	New River		
Eigenmannia sp.	Kaso	–	–	2	0	2
Sternopygus astrabes		–	1	2	0	3
Sternopygus n sp.		–	–	2	0	2
Rhamphichthyidae						
Gymnorhamphichthys rondoni		8	1	1	1	10
MYLIOBATIFORMES						
Potamotrygonidae						
Potamotrygon boesemani		–	–	12	0	12
OSTEOGLOSSIFORMES						
Osteoglossidae						
Osteoglossum bicirrhosum		–	–	–	1	0
SILURIFORMES						
Aspredinidae						
Bunocephalus amaurus		3	–	–	0	3
Bunocephalus verrucosus (?=amaurus)		–	–	–	1	0
Auchenipteridae						
Ageneiosus sp.		–	–	–	1	0
Auchenipterichthys coracoideus		–	–	–	1	0
Auchenipterus sp.		1	–	–	0	1
Tatia creutzbergi		–	–	–	1	0
Callichthyidae						
Callichthys callichthys		14	–	–	0	14
Corydoras blochi		–	–	3	0	3
Hoplisoma baderi	Xomikoko	–	–	2	0	2
Hoplisoma bondi	Xomikoko	8	9	–	0	17
Hoplisoma melanistius	Xomikoko	–	–	–	1	0
Hoplisoma sipaliwini	Xomikoko	–	–	2	0	2
Megalechis thoracata		7	–	–	0	7
Cetopsidae						
Cetopsidium roae		–	–	2	0	2
Doradidae						
Acanthodoras spinosissimus		–	–	–	1	0
Amblydoras affinis		–	–	–	1	0
Doras carinatus	Korkori	3	5	–	0	8
Physopyxis ananas		–	–	–	1	0
Heptapteridae						
Brachyglanis sp.		1	–	–	0	1
Chasmocranus brevior		1	–	12	1	13
Imparfinis hasemani		2	–	2	0	4
Imparfinis cf. *hasemani*		2	–	–	0	2
Imparfinis sp.		1	–	–	0	1

Fishes

	Conservation status (IUCN 2024)	New records Guyana	Potential new species	Record type	Uses
	LC	1	1	col	–
	LC	1	0	col	–
	LC	1	1	col	–
	LC	0	0	col	–
	NT	1	0	col	OR, FF
	LC	0	0	ref	FF, GF
	LC	0	0	col	–
	LC	0	0	ref	–
	LC	0	0	ref	FF
	LC	0	0	ref	–
	LC	0	0	col	–
	NL	1	0	ref	–
	LC	0	0	col	–
	LC	0	0	col	OR
	LC	1	0	col	OR
	LC	0	0	col	OR
	LC	0	0	col	OR
	LC	0	0	ref	OR
	LC	0	0	col	FF
	LC	0	0	col	–
	LC	0	0	ref	OR
	LC	0	0	ref	–
	LC	0	0	col	–
	LC	0	0	ref	–
	LC	0	0	col	–
	LC	0	0	col	–
	LC	0	0	col	–
	LC	0	1	col	–
	LC	0	1	col	–

LEGEND

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col = Specimen collected

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Uses

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Appendix 3

Fishes

Scientific name	Name in Waiwai	Number of individuals recorded in the RI32 campsites			Species recorded in Northern Lowland Essequibo (Willink et al. 2013)	Total number of individuals
		Amuku	Monkey Jump	New River		
Pimelodella altipinnis	Warakara	3	–	–	0	3
Pimelodella cristata	Warakara	1	11	–	0	12
Pimelodella geryi	Warakara	–	–	45	0	45
Pimelodella leptosoma	Warakara	–	2	–	0	2
Pimelodella sp.	Warakara	2	–	–	0	2
Rhamdia foina		4	–	–	0	4
Rhamdia sp.		1	–	–	0	1
Loricariidae						
Loricariidae sp.		–	–	–	1	0
Ancistrus cf. *leucostictus*	Pore	–	–	2	0	2
Ancistrus leucostictus	Pore	–	3	–	0	3
Ancistrus lithurgicus	Pore	1	–	–	0	1
Ancistrus nudiceps	Pore	1	5	9	0	15
Ancistrus sp.	Pore	–	1	–	0	1
Cteniloricaria platystoma		5	–	37	1	42
Guyanancistrus brevispinis		–	–	21	0	21
Hypoptopoma guianense		–	–	–	1	0
Hypostomus corantijni		–	–	6	0	6
Hypostomus macushi		19	1	–	0	20
Hypostomus pseudohemiurus		–	–	3	0	3
Hypostomus sp.		–	1	5	0	6
Hypostomus taphorni		2	–	–	1	2
Loricariichthys sp.		–	–	–	1	0
Metaloricaria nijsseni	Paxpa	1	–	11	0	12
Paralithoxus cf. *surinamensis*		–	–	15	0	15
Parotocinclus britskii		–	–	–	1	0
Pseudacanthicus fordii		–	–	1	0	1
Pseudancistrus barbatus		1	–	–	0	1
Pseudancistrus corantijniensis		–	–	38	0	38
Pseudancistrus nigrescens		6	–	–	1	6
Rineloricaria fallax		6	–	9	0	15
Rineloricaria platyura		–	–	–	1	0
Rineloricaria sp.		–	–	–	1	0
Pimelodidae						
Leiarius mamoratus		–	–	–	1	0
Megalonema platycephalum		–	–	–	1	0
Phractocephalus hemioliopterus		–	–	2	1	2
Pimelodus albofasciatus		–	1	3	0	4
Pimelodus ornatus	Wakurkawa	–	2	2	0	4
Pinirampus pirinampu		–	–	–	1	0
Pseudoplatystoma fasciatum		–	–	–	1	0

Fishes

	Conservation status (IUCN 2024)	New records Guyana	Potential new species	Record type	Uses
	DD	0	0	col	–
	LC	0	0	col	–
	LC	1	0	col	–
	LC	0	0	col	–
	LC	0	0	col	–
	LC	0	0	col	–
	LC	0	0	col	–
	LC	0	0	ref	–
	LC	0	0	col	OR
	LC	0	0	col	OR
	LC	0	0	col	OR
	LC	0	0	col	OR
	LC	0	0	col	OR
	LC	0	0	col	OR
	LC	0	0	col	–
	LC	0	0	ref	OR
	LC	1	0	col	OR
	LC	0	0	col	OR
	LC	1	0	col	OR
	LC	0	0	col	OR
	LC	0	0	col	OR
	LC	0	0	ref	–
	LC	1	0	ref	–
	LC	1	1	col	–
	LC	0	0	ref	–
	DD	1	0	col	–
	LC	0	0	col	OR
	LC	1	0	col	OR
	LC	0	0	ref	OR
	LC	0	0	col	–
	LC	0	0	ref	–
	LC	0	1	col	–
	LC	0	0	ref	FF, GF
	LC	0	0	col	–
	LC	0	0	obs	FF
	LC	0	0	col	–
	LC	0	0	col	FF, OR
	LC	0	0	ref	FF
	LC	0	0	ref	FF

LEGEND

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Appendix 3

Fishes

Scientific name	Name in Waiwai	Number of individuals recorded in the RI32 campsites			Species recorded in Northern Lowland Essequibo (Willink et al. 2013)	Total number of individuals	
		Amuku	Monkey Jump	New River			
Pseudoplatystoma cf. *reticulatum*		–	–	1	0	1	
Pseudopimelodidae							
Lophiosilurus albomarginatus		–	–	1	0	1	
Lophiosilurus nigricauda		–	–	2	0	2	
Microglanis cf. *secundus*		–	–	2	0	2	
Pseudopimelodus bufonius		–	–	–	1	0	
Trichomycteridae							
Ituglanis gracilior		2	–	–	0	2	
Ochmacanthus cf. *alternus*		–	–	2	0	2	
Ochmacanthus flabelliferus		14	2	–	1	16	
Paracanthopoma parva		–	–	–	1	0	
Vandellia beccarii		–	–	–	1	0	
SYNBRANCHIFORMES							
Synbranchidae							
Synbranchus marmoratus		1	1	–	1	2	

Fishes

	Conservation status (IUCN 2024)	New records Guyana	Potential new species	Record type	Uses
	LC	0	1	obs	FF
	LC	0	0	col	–
	LC	1	0	col	–
	LC	0	1	col	–
	LC	0	0	ref	–
	LC	0	0	col	–
	NL	0	0	col	–
	NL	0	0	col	–
	LC	0	0	ref	–
	LC	0	0	ref	–
	LC	0	0	col	–

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Appendix 4

Regional checklist of amphibians and reptiles

List of expected amphibian and reptile species across southern Guyana and adjacent regions, based on the scientific literature. Numbered columns correspond to the following areas: 1) Kanashen/New River/ Shudikar-wau (Cole et al. 2013); 2) Grão-Pará North (Ávila-Pires et al. 2010); 3) Kanashen Amerindian Protected Area (Señaris et al. 2008); 4) Kanuku Mountains Protected Area (PAC 2015); 5) molecular sampling of frogs under a 150-km proximity buffer from the Camp Amuku and Camp New River. Species with an asterisk (*) are highlighted as a high potential for scientific novelties.

Scientific name	Sampling localities				
	1	2	3	4	5
AMPHIBIA (N = 73)					
ANURA					
Allophrynidae					
Allophryne ruthveni	–	–	X	–	X
Aromobatidae					
Allobates femoralis	–	X	–	X	X
*Allobates sumtuosus**	–	X	–	–	X
Anomaloglossus sp. Acarai*	–	X	–	–	X
Anomaloglossus sp. Kanuku*	–	–	–	X	–
Bufonidae					
*Amazophrynella manaos**	–	X	–	–	X
Rhaebo guttatus	–	–	X	X	X
Rhinella marina	–	–	X	X	X
Rhinella martyi	–	–	X	X	X
Rhinella merianae	–	–	–	X	X
Rhinella sp. nov.*	–	X	–	–	–
Centrolenidae					
Hyalinobatrachium mondolfii	X	–	–	X	–
*Hyalinobatrachium taylori**	X	–	–	–	–
Ceratophryidae					
Ceratophrys cornuta	X	–	–	–	–
Dendrobatidae					
*Ameerega picta**	–	–	X	–	–
Ameerega trivittata	–	–	–	X	X
Dendrobates tinctorius	X	X	X	–	–
Hylidae					
Boana boans	–	X	X	X	X
Boana calcarata	–	–	X	–	X
*Boana cinerascens**	–	–	X	–	X
Boana multifasciata	–	–	–	X	X
Boana ornatissima	–	–	X	X	X
Boana aff. *semilineata*	–	–	X	–	X
Boana xerophylla	–	–	–	X	X
*Boana wavrini**	–	–	X	–	–
Lysapsus laevis	–	–	–	–	X

Regional checklist of amphibians and reptiles

Scientific name	Sampling localities				
	1	2	3	4	5
Osteocephalus helenae (*buckleyi*)	X	–	–	–	X
*Osteocephalus cabrerai**	–	–	X	–	–
Osteocephalus leprieurii	–	–	X	–	X
*Osteocephalus oophagus**	–	X	–	X	X
Osteocephalus taurinus	–	X	–	X	X
*Scinax proboscideus**	X	–	–	–	–
Scinax ruber	–	–	X	X	–
*Trachycephalus hadroceps**	X	–	–	–	–
Leptodactylidae					
Adenomera andreae	X	X	–	X	X
Adenomera heyeri	–	X	–	–	X
*Adenomera hylaedactyla**	–	–	–	–	X
Leptodactylus fuscus	–	–	–	–	X
*Leptodactylus fremitus**	–	–	–	–	X
Leptodactylus guianensis	–	–	–	X	X
Leptodactylus knudseni	–	X	X	X	X
*Leptodactylus longirostris**	–	–	–	–	X
Leptodactylus macrosternum	–	–	–	X	–
Leptodactylus mystaceus	–	–	X	X	X
*Leptodactylus myersi**	–	–	–	X	–
Leptodactylus nesiotus	–	–	–	–	X
Leptodactylus pentadactylus	X	X	–	X	X
Leptodactylus petersii	–	–	–	–	X
Leptodactylus rhodomystax	–	–	X	–	X
Leptodactylus validus (*leptodactyloides*)	–	X	–	–	–
*Lithodytes lineatus**	–	X	–	X	–
Physalaemus ephippifer	–	–	–	–	X
*Pleurodema brachyops**	–	–	–	–	X
Pseudopaludicola boliviana	–	–	–	–	X
Microhylidae					
*Chiasmocleis hudsoni**	X	–	–	–	–
*Chiasmocleis shudikarensis**	X	–	–	–	X
Elachistocleis surinamensis	–	–	–	–	X
*Otophryne pyburni**	–	X	–	–	–
*Synapturanus mirandaribeiroi**	X	X	–	–	–
Phyllomedusidae					
Phyllomedusa bicolor	–	–	X	–	X
Phyllomedusa vaillantii	–	X	X	–	X
Pithecopus hypochondrialis	–	–	X	X	–
Pipidae					
*Pipa pipa**	–	–	X	X	X

Appendix 4

Regional checklist of amphibians and reptiles

Scientific name	Sampling localities				
	1	2	3	4	5
Ranidae					
Lithobates palmipes	–	–	–	–	X
Strabomantidae					
*Pristimantis grandoculis**	–	–	–	–	X
*Pristimantis guianensis (marmoratus)**	–	X	–	–	–
*Pristimantis koehleri**	–	X	–	–	X
Pristimantis inguinalis	X	X	–	–	X
*Pristimantis zeuctotylus**	X	X	–	–	X
Pristimantis aff. *zeuctotylus**	–	–	–	–	X
GYMNOPHIONA					
Caeciliidae					
Caecilia pressula (= *tentaculata*)*	X	–	–	–	–
Caecilia sp.	–	–	X	–	–
Rhinatrematidae					
Rhinatrema uaiuai	–	X	–	–	–
REPTILES (N = 78)					
CROCODYLIA					
Alligatoridae					
Caiman crocodilus	–	–	–	X	–
*Melanosuchus niger**	–	–	X	X	–
Paleosuchus trigonatus	–	X	X	X	–
SQUAMATA					
SAURIA					
Amphisbaenidae					
*Amphisbaena vanzolinii**	X	–	X	–	–
Alopoglossidae					
*Alopoglossus brevifrontalis**	–	X	–	–	–
Gymnophthalmidae	–	–	–	–	–
*Amapasaurus tetradactylus**	–	X	–	–	–
Arthrosaura kockii	–	X	–	–	–
Bachia flavescens	–	X	–	–	–
*Cercosaura argulus**	X	–	–	–	–
*Cercosaura ocellata**	–	X	–	X	–
Loxopholis guianense	–	–	–	X	–
Neusticurus bicarinatus	–	X	–	X	–
Neusticurus rudis	–	–	–	X	–
Neusticurus surinamensis	–	X	X	–	–
Tretioscincus agilis	–	X	–	–	–
Iguanidae					
Iguana iguana	–	–	X	X	–
Dactyloidae					
Anolis chrysolepis	–	X	X	–	–

Regional checklist of amphibians and reptiles

Scientific name	Sampling localities				
	1	2	3	4	5
Anolis fuscoauratus	–	X	–	–	–
Anolis punctatus	–	–	X	–	–
Anolis planiceps	–	–	–	X	–
Gekkonidae					
Hemidactylus mabouia	–	–	–	X	–
Phyllodactylidae	–	–	–	–	–
Thecadactylus rapicauda	–	X	X	X	–
Scincidae					
*Copeoglossum nigropunctatum**	–	X	X	X	–
Sphaerodactylidae					
Chatogekko amazonicus	–	X	–	X	–
Gonatodes annularis	–	X	–	–	–
Gonatodes humeralis	–	X	X	X	–
*Pseudogonatodes guianensis**	X	X	–	–	–
Teiidae					
Ameiva ameiva	–	X	X	X	–
Cnemidophorus lemniscatus	–	–	–	X	–
Kentropyx calcarata	–	X	X	X	–
Tupinambis teguixin	–	–	X	–	–
Tropiduridae					
Plica plica	–	X	X	–	–
Plica umbra	–	X	–	X	–
Tropidurus hispidus	–	–	–	X	–
Uranoscodon superciliosus	–	X	X	X	–
SERPENTES					
Aniliidae					
Anilius scytale	–	–	X	–	–
Anomalepididae					
Typhlophis squamosus	–	–	X	–	–
Boidae					
Boa constrictor	–	–	X	–	X
Corallus caninus	–	X	X	X	–
Corallus hortulana	–	–	X	X	–
Eunectes murinus	–	–	X	–	–
Colubridae					
Chironius fuscus	–	X	–	X	–
Chironius scurrula	–	X	X	–	–
Drymoluber dichrous	–	–	–	–	X
Dendrophidion dendrophis	–	X	–	–	–
Mastigodryas boddaerti	–	–	–	X	–
Spilotes pullatus	–	–	–	X	–
Spilotes sulphureus	–	X	–	–	–

Appendix 4

Regional checklist of amphibians and reptiles

Scientific name	Sampling localities				
	1	2	3	4	5
Dipsadidae					
*Apostolepis quinquelineata**	–	X	–	–	–
*Atractus schach**	X	–	–	–	–
*Atractus torquatus**	–	X	X	X	–
Dipsas catesbyi	–	–	–	X	–
Dipsas indica	–	–	X	–	–
Dipsas variegata	–	–	–	X	–
Erythrolamprus aesculapii	–	X	X	–	–
Erythrolamprus reginae	–	X	–	–	–
Erythrolamprus typhlus	–	–	–	X	–
Helicops angulatus	–	–	X	–	–
Helicops sp.	–	–	X	–	–
Imantodes cenchoa	–	–	X	X	–
Leptodeira ashmeadii	–	–	X	–	–
*Ninia hudsoni**	X	–	–	–	–
Siphlophis compressus	–	–	X	X	–
*Taeniophallus brevirostris**	–	X	X	–	–
*Taeniophallus nicagus**	–	X	–	–	–
Xenodon werneri	–	X	–	–	–
Xenopholis scalaris	X	–	–	–	–
Xenoxybelis argenteus	–	–	–	X	–
Elapidae					
*Micrurus averyi**	X	X	–	–	–
Leptotyphlopidae					
*Epictia tenella**	–	X	–	X	–
Viperidae					
Bothrops atrox	–	X	–	X	–
Bothrops bilineatus	–	–	–	X	–
TESTUDINES					
Chelidae					
Chelus fimbriata	–	–	–	X	–
Platemys platycephala	X	–	–	–	–
Geoemydidae					
Rhinoclemmys punctularia	X	–	X	–	–
Podocnemididae					
Podocnemis unifilis	–	–	–	X	–
Testudinidae					
Chelonoidis carbonaria	–	–	X	X	–
Chelonoidis denticulata	–	X	X	X	–

Amphibians and reptiles

Amphibians and reptiles recorded during a rapid inventory of the Acarai-Corentyne Corridor in southern Guyana on 5–23 November 2024, by Antoine Fouquet and Leandro J. C. L. Moraes, with their respective sampling methods and number of sampled individuals. We deposited 178 voucher specimens and 186 tissue samples in the Field Museum of Natural History, Chicago, IL, USA (field voucher numbers AF5949–6134).

Scientific name	Number of records at each locality			Total number of records	Sampling methods
	Camp Amuku	Camp Monkey Jump	Camp New River		
AMPHIBIA (N = 47)					
ANURA (*n* = 46)					
Allophrynidae					
Allophryne ruthveni Gaige, 1926	2	1	8	11	NAS
Aromobatidae					
Allobates femoralis (Boulenger, 1884)	1	1	22	24	DAS, NAS, OE
Allobates sumtuosus (Morales, 2002)	4	37	26	67	DAS, NAS, OE
Anomaloglossus sp.	–	2	–	2	DAS
Bufonidae					
Amazophrynella manaos Rojas et al., 2014	1	38	–	39	DAS, NAS
Rhaebo guttatus (Schneider, 1799)	20	23	20	63	DAS, NAS, OE
Rhinella lescurei Fouquet et al., 2007	1	8	–	9	DAS, NAS, OE
Rhinella marina (Linnaeus, 1758)	1	10	4	15	NAS, OE
Rhinella martyi Fouquet et al., 2007	72	38	13	123	DAS, NAS, OE
Centrolenidae					
Vitreorana ritae (Lutz, 1952)	–	–	6	6	NAS
Ceratophryidae					
Ceratophrys cornuta (Linnaeus, 1758)	–	–	3	3	NAS
Dendrobatidae					
Ameerega trivittata (Spix, 1824)	–	1	8	9	DAS, NAS, OE
Dendrobates tinctorius (Cuvier, 1797)	2	3	–	5	DAS, OE
Hylidae					
Boana boans (Linnaeus, 1758)	71	58	41	170	DAS, NAS, OE
Boana aff. *multifasciata*	1	7	–	8	NAS
Boana aff. *semilineata*	–	–	16	16	NAS
Dendropsophus marmoratus (Laurenti, 1768)	–	–	5	5	NAS
Osteocephalus helenae (Ruthven, 1919)	–	–	2	2	NAS
Osteocephalus leprieurii (Duméril & Bibron, 1841)	5	32	6	43	NAS
Osteocephalus oophagus Jungfer & Schiesari, 1995	–	–	15	15	NAS
Osteocephalus taurinus Steindachner, 1862	2	2	5	9	NAS
Scinax gr. *cruentomma*	–	1	–	1	NAS
Scinax proboscideus (Brongersma, 1933)	–	3	–	3	NAS

LEGEND

DAS = diurnal active surveys
NAS = nocturnal active surveys
OE = occasional encounters (outside standard samplings, or recorded by other team members or local experts)
eDNA = environmental DNA

Appendix 5

Amphibians and reptiles

Scientific name	Number of records at each locality			Total number of records	Sampling methods
	Camp Amuku	Camp Monkey Jump	Camp New River		
Trachycephalus resinifictrix (Goeldi, 1907)	–	3	13	16	NAS
Leptodactylidae					
Adenomera andreae (Müller, 1923)	–	7	19	26	DAS, NAS
Leptodactylus fremitus Carvalho et al. 2022	–	–	1	1	NAS
Leptodactylus guianensis Heyer & de Sá, 2011	2	–	15	17	NAS, OE
Leptodactylus knudseni Heyer, 1972		1	14	15	NAS, OE
Leptodactylus mystaceus (Spix, 1824)	1	9	23	33	DAS, NAS, OE
Leptodactylus nesiotus Heyer, 1994	–	–	41	41	NAS
Leptodactylus pentadactylus (Laurenti, 1768)	2	4	4	10	NAS, OE
Leptodactylus petersii (Steindachner, 1864)	4	4	31	39	DAS, NAS
Leptodactylus validus Garman, 1888	1	–	–	1	NAS
Lithodytes lineatus (Schneider, 1799)	–	–	2	2	NAS
Physalaemus ephippifer (Steindachner, 1864)	–	–	10	10	NAS
Microhylidae					
Chiasmocleis haddadi Peloso et al., 2014	–	–	7	7	NAS
Chiasmocleis shudikarensis Dunn, 1949	–	–	1	1	NAS
Ctenophryne geayi Mocquard, 1904	–	–	1	1	DAS
Hamptophryne boliviana (Parker, 1927)	–	–	19	19	NAS
Synapturanus mirandaribeiroi Nelson & Lescure, 1975	1	15	101	117	NAS
Synapturanus sp.	–	–	10	10	NAS
Pipidae					
Pipa aspera Müller, 1924	–	–	1	1	eDNA
Pipa pipa (Linnaeus, 1758)	–	–	3	3	NAS
Strabomantidae					
Pristimantis grandoculis (Van Lidth de Jeude, 1904)	–	–	1	1	NAS
Pristimantis koehleri Padial & De la Riva, 2009	–	9	23	32	DAS, NAS
Pristimantis zeuctotylus (Lynch & Hoogmoed, 1977)	–	2	3	5	DAS, NAS
GYMNOPHIONA (*n* = 1)					
Caeciliidae					
Caecilia gracilis Shaw, 1802	–	1	–	1	OE
REPTILIA (N = 51)					
CROCODYLIA (*n* = 2)					
Alligatoridae					
Caiman crocodilus (Linnaeus, 1758)	5	1	2	8	NAS, OE
Paleosuchus trigonatus (Schneider, 1801)	–	3	–	3	NAS
SQUAMATA (*n* = 45)					
Suborder 'Sauria'					
Alopoglossidae					
Alopoglossus angulatus (Linnaeus, 1758)	–	–	2	2	DAS
Dactyloidae					
Anolis chrysolepis Duméril & Bibron, 1837	1	2	6	9	DAS, NAS, OE
Anolis fuscoauratus d'Orbigny, 1837	–	–	1	1	NAS

Scientific name	Number of records at each locality			Total number of records	Sampling methods
	Camp Amuku	Camp Monkey Jump	Camp New River		
Anolis punctatus Daudin, 1802	–	–	2	2	DAS, OE
Gymnophthalmidae					
Arthrosaura kockii (Lidth de Jeune, 1904)	–	–	1	1	DAS
Arthrosaura reticulata (O'Shaughnessy, 1881)	1	1	4	6	DAS, NAS
Cercosaura argulus Peters, 1863	–	1	–	1	OE
Loxopholis guianense (Ruibal, 1952)	–	4	13	17	DAS, NAS
Loxopholis percarinatum (Müller, 1923)	1	–	1	2	DAS, NAS
Neusticurus surinamensis (Müller, 1923)	2	–	–	2	DAS
Tretioscincus agilis (Ruthven, 1916)	–	–	1	1	OE
Phyllodactylidae					
Thecadactylus rapicauda (Houttuyn, 1782)	–	–	2	2	NAS
Scincidae					
Copeoglossum nigropunctatum (Spix, 1825)	6	5	10	21	DAS, OE
Sphaerodactylidae					
Chatogekko amazonicus (Andersson, 1918)	2	2	1	5	DAS
Gonatodes humeralis (Guichenot, 1855)	2	4	14	20	DAS, NAS, OE
Pseudogonatodes guianensis Parker, 1935	–	2	1	3	DAS, NAS
Teiidae					
Ameiva ameiva (Linnaeus, 1758)	20	10	29	59	DAS, OE
Kentropyx calcarata Spix, 1825	67	50	77	194	DAS, NAS, OE
Tupinambis teguixin (Linnaeus, 1758)	3	–	–	3	DAS, OE
Tropiduridae					
Plica plica (Linnaeus, 1758)	2	–	3	5	DAS, OE
Plica umbra (Linnaeus, 1758)	4	4	–	8	NAS, OE
Uranoscodon superciliosus (Linnaeus, 1758)	1	8	4	13	DAS, NAS, OE
SERPENTES					
Anomalepididae					
Typhlophis squamosus (Schlegel, 1839)	–	–	1	1	NAS
Boidae					
Corallus caninus (Linnaeus, 1758)	1	–	–	1	NAS
Corallus hortulana (Linnaeus, 1758)	2		–	2	NAS
Epicrates cenchria (Linnaeus, 1758)		1	–	1	OE
Eunectes murinus (Linnaeus, 1758)	1	–	–	1	OE
Colubridae					
Chironius carinatus (Linnaeus, 1758)	1	–	–	1	DAS
Chironius fuscus (Linnaeus, 1758)	–	–	1	1	OE
Chironius multiventris Schmidt & Walker, 1943	–	1	1	2	DAS, OE
Chironius scurrula (Wagler, 1824)	1	–	–	1	OE

LEGEND

DAS = diurnal active surveys

NAS = nocturnal active surveys

OE = occasional encounters (outside standard samplings, or recorded by other team members or local experts)

eDNA = environmental DNA

Appendix 5

Amphibians and reptiles

Scientific name	Number of records at each locality			Total number of records	Sampling methods
	Camp Amuku	Camp Monkey Jump	Camp New River		
Dendrophidion dendrophis (Schlegel, 1837)	–	–	1	1	NAS
Drymarchon corais (Boie, 1827)	–	–	1	1	OE
Drymoluber dichrous (Peters, 1863)	–	–	1	1	OE
Spilotes sulphureus (Wagler, 1824)	–	–	1	1	OE
Dipsadidae					
Dipsas catesbyi (Sentzen, 1796)	–	–	1	1	NAS
Erythrolamprus aesculapii (Linnaeus, 1766)	–	1	–	1	OE
Erythrolamprus miliaris (Linnaeus, 1758)	–	1	–	1	NAS
Helicops angulatus (Linnaeus, 1758)	–	–	2	2	NAS
Imantodes cenchoa (Linnaeus, 1758)	–	–	1	1	OE
Oxyrhopus petolarius (Linnaeus, 1758)	2	–	–	2	NAS
Oxyrhopus vanidicus Lynch, 2009	–	1	–	1	OE
Elapidae					
Micrurus lemniscatus (Linnaeus, 1758)	–	2	–	2	NAS
Leptotyphlopidae					
Epictia tenella (Klauber, 1939)	–	–	1	1	NAS
Viperidae					
Bothrops atrox (Linnaeus, 1758)	–	–	2	2	NAS
TESTUDINES (*n* = 4)					
Geoemydidae					
Rhinoclemmys punctularia (Daudin, 1801)	–	1	–	1	eDNA
Podocnemididae					
Podocnemis expansa (Schweigger, 1812)	–	–	1	1	OE
Podocnemis unifilis Troschel, 1848	–	–	1	1	OE
Testudinidae					
Chelonoidis denticulata (Linnaeus, 1766)	1	1	–	2	OE
Total number of records	**321**	**426**	**731**	**1477**	

Amphibians and reptiles

LEGEND

DAS = diurnal active surveys
NAS = nocturnal active surveys
OE = occasional encounters (outside standard samplings, or recorded by other team members or local experts)
eDNA = environmental DNA

Birds

Birds recorded by Cameron Rutt, Asaph Wilson, and Kwang Suse during a rapid inventory of the Acarai-Corentyne Corridor of southern Guyana (6–24 November 2024). Taxonomy and nomenclature follow the eBird/Clements Checklist of Birds of the World (Clements et al. 2023). The campsite columns sum the number of days that each species was detected at every camp, with a maximum number of five sampling days at Camp Amuku, four days at Camp Monkey Jump, and six days at Camp New River, for a total of 15 complete sampling days. The 'Travel' column indicates a select list of species—mostly waterbirds, shorebirds, raptors, and swallows—that were detected during three days of travel along the Upper Essequibo River (11 November 2024 and 16–17 November 2024). The only Great Egrets (3) were detected by the advance team along the Essequibo River (4 November 2024). Two species only detected by eDNA are also included in this list.

Family	Common name	Scientific name	
Tinamidae (Tinamous)	Great Tinamou	*Tinamus major*	
Tinamidae (Tinamous)	Cinereous Tinamou	*Crypturellus cinereus*	
Tinamidae (Tinamous)	Variegated Tinamou	*Crypturellus variegatus*	
Tinamidae (Tinamous)	Rusty Tinamou	*Crypturellus brevirostris*	
Anatidae (Ducks, Geese, and Waterfowl)	Muscovy Duck	*Cairina moschata*	
Cracidae (Guans, Chachalacas, and Curassows)	Variable Chachalaca	*Ortalis motmot*	
Cracidae (Guans, Chachalacas, and Curassows)	Marail Guan	*Penelope marail*	
Cracidae (Guans, Chachalacas, and Curassows)	Blue-throated Piping-Guan	*Pipile cumanensis*	
Cracidae (Guans, Chachalacas, and Curassows)	Black Curassow	*Crax alector*	
Odontophoridae (New World Quail)	Marbled Wood-Quail	*Odontophorus gujanensis*	
Columbidae (Pigeons and Doves)	Pale-vented Pigeon	*Patagioenas cayennensis*	
Columbidae (Pigeons and Doves)	Plumbeous Pigeon	*Patagioenas plumbea*	
Columbidae (Pigeons and Doves)	Ruddy Pigeon	*Patagioenas subvinacea*	
Columbidae (Pigeons and Doves)	Ruddy Quail-Dove	*Geotrygon montana*	
Columbidae (Pigeons and Doves)	Gray-fronted Dove	*Leptotila rufaxilla*	
Cuculidae (Cuckoos)	Rufous-winged Ground-Cuckoo	*Neomorphus rufipennis*	
Cuculidae (Cuckoos)	Squirrel Cuckoo	*Piaya cayana*	
Cuculidae (Cuckoos)	Black-bellied Cuckoo	*Piaya melanogaster*	
Caprimulgidae (Nightjars and Allies)	Short-tailed Nighthawk	*Lurocalis semitorquatus*	
Caprimulgidae (Nightjars and Allies)	Blackish Nightjar	*Nyctipolus nigrescens*	
Caprimulgidae (Nightjars and Allies)	Ladder-tailed Nightjar	*Hydropsalis climacocerca*	
Nyctibiidae (Potoos)	Rufous Potoo	*Phyllaemulor bracteatus*	
Nyctibiidae (Potoos)	Great Potoo	*Nyctibius grandis*	
Nyctibiidae (Potoos)	Long-tailed Potoo	*Nyctibius aethereus*	
Nyctibiidae (Potoos)	Common Potoo	*Nyctibius griseus*	
Apodidae (Swifts)	Band-rumped Swift	*Chaetura spinicaudus*	
Apodidae (Swifts)	Chapman's Swift (presumed)	*Chaetura chapmani*	
Apodidae (Swifts)	Fork-tailed Palm Swift	*Tachornis squamata*	
Trochilidae (Hummingbirds)	Crimson Topaz	*Topaza pella*	
Trochilidae (Hummingbirds)	White-necked Jacobin	*Florisuga mellivora*	
Trochilidae (Hummingbirds)	Rufous-breasted Hermit	*Glaucis hirsutus*	
Trochilidae (Hummingbirds)	Pale-tailed Barbthroat	*Threnetes leucurus*	
Trochilidae (Hummingbirds)	Straight-billed Hermit	*Phaethornis bourcieri*	
Trochilidae (Hummingbirds)	Long-tailed Hermit	*Phaethornis superciliosus*	
Trochilidae (Hummingbirds)	Reddish Hermit	*Phaethornis ruber*	

Birds

	Camp Amuku	Camp Monkey Jump	Camp New River	Total (15 days)	Travel	IUCN Red List (2024)	CITES Appendices
	3	4	6	13	–	–	–
	–	2	2	4	–	–	–
	4	4	5	13	–	–	–
	1	1	–	2	–	–	–
	–	1	–	1	x	–	–
	–	2	–	2	–	–	–
	4	3	3	10	–	–	–
	–	–	3	3	–	–	–
	2	4	5	11	–	–	–
	3	1	6	10	–	–	–
	–	–	2	2	–	–	–
	3	2	6	11	–	–	–
	3	2	2	7	–	–	–
	1	–	–	1	–	–	–
	1	2	5	8	–	–	–
	1	–	–	1	–	–	–
	1	1	6	8	–	–	–
	5	3	1	9	–	–	–
	4	2	4	10	–	–	–
	1	2	4	7	–	–	–
	1	1	3	5	–	–	–
	–	1	–	1	–	–	–
	–	–	1	1	–	–	–
	–	–	1	1	–	–	–
	2	4	2	8	–	–	–
	2	–	4	6	–	–	–
	–	–	–	–	x	–	–
	–	–	–	–	x	–	–
	2	–	4	6	–	–	Appendix II
	1	1	1	3	–	–	Appendix II
	–	–	x	x	–	–	Appendix II
	–	1	2	3	–	–	Appendix II
	1	1	3	5	–	–	Appendix II
	–	–	2	2	–	–	Appendix II
	3	3	5	11	–	–	Appendix II

Appendix 6

Birds

Family	Common name	Scientific name
Trochilidae (Hummingbirds)	Black-eared Fairy	*Heliothryx auritus*
Trochilidae (Hummingbirds)	Black-throated Mango	*Anthracothorax nigricollis*
Trochilidae (Hummingbirds)	Racket-tipped Thorntail	*Discosura longicaudus*
Trochilidae (Hummingbirds)	Gray-breasted Sabrewing	*Campylopterus largipennis*
Trochilidae (Hummingbirds)	Fork-tailed Woodnymph	*Thalurania furcata*
Trochilidae (Hummingbirds)	Rufous-throated Sapphire	*Hylocharis sapphirina*
Rallidae (Rails, Gallinules, and Coots)	Gray-cowled Wood-Rail	*Aramides cajaneus*
Heliornithidae (Finfoots)	Sungrebe	*Heliornis fulica*
Psophiidae (Trumpeters)	Gray-winged Trumpeter	*Psophia crepitans*
Scolopacidae (Sandpipers and Allies)	Spotted Sandpiper	*Actitis macularius*
Scolopacidae (Sandpipers and Allies)	Solitary Sandpiper	*Tringa solitaria*
Scolopacidae (Sandpipers and Allies)	Greater Yellowlegs	*Tringa melanoleuca*
Scolopacidae (Sandpipers and Allies)	White-rumped Sandpiper	*Calidris fuscicollis*
Scolopacidae (Sandpipers and Allies)	Pectoral Sandpiper	*Calidris melanotos*
Scolopacidae (Sandpipers and Allies)	Semipalmated Sandpiper	*Calidris pusilla*
Laridae (Gulls, Terns, and Skimmers)	Black Skimmer	*Rynchops niger*
Laridae (Gulls, Terns, and Skimmers)	Yellow-billed Tern	*Sternula superciliaris*
Eurypygidae (Sunbittern)	Sunbittern	*Eurypyga helias*
Ciconiidae (Storks)	Wood Stork	*Mycteria americana*
Anhingidae (Anhingas)	Anhinga	*Anhinga anhinga*
Ardeidae (Herons, Egrets, and Bitterns)	Rufescent Tiger-Heron	*Tigrisoma lineatum*
Ardeidae (Herons, Egrets, and Bitterns)	Boat-billed Heron	*Cochlearius cochlearius*
Ardeidae (Herons, Egrets, and Bitterns)	Agami Heron	*Agamia agami*
Ardeidae (Herons, Egrets, and Bitterns)	Capped Heron	*Pilherodius pileatus*
Ardeidae (Herons, Egrets, and Bitterns)	Little Blue Heron	*Egretta caerulea*
Ardeidae (Herons, Egrets, and Bitterns)	Snowy Egret	*Egretta thula*
Ardeidae (Herons, Egrets, and Bitterns)	Striated Heron	*Butorides striata*
Ardeidae (Herons, Egrets, and Bitterns)	Great Egret	*Ardea alba*
Ardeidae (Herons, Egrets, and Bitterns)	Cocoi Heron	*Ardea cocoi*
Threskiornithidae (Ibises and Spoonbills)	Green Ibis	*Mesembrinibis cayennensis*
Cathartidae (New World Vultures)	King Vulture	*Sarcoramphus papa*
Cathartidae (New World Vultures)	Black Vulture	*Coragyps atratus*
Cathartidae (New World Vultures)	Greater Yellow-headed Vulture	*Cathartes melambrotus*
Pandionidae (Osprey)	Osprey	*Pandion haliaetus*
Accipitridae (Hawks, Eagles, and Kites)	Gray-headed Kite	*Leptodon cayanensis*
Accipitridae (Hawks, Eagles, and Kites)	Swallow-tailed Kite	*Elanoides forficatus*
Accipitridae (Hawks, Eagles, and Kites)	Crested Eagle	*Morphnus guianensis*
Accipitridae (Hawks, Eagles, and Kites)	Harpy Eagle	*Harpia harpyja*
Accipitridae (Hawks, Eagles, and Kites)	Black Hawk-Eagle	*Spizaetus tyrannus*
Accipitridae (Hawks, Eagles, and Kites)	Ornate Hawk-Eagle	*Spizaetus ornatus*
Accipitridae (Hawks, Eagles, and Kites)	Double-toothed Kite	*Harpagus bidentatus*
Accipitridae (Hawks, Eagles, and Kites)	Great Black Hawk	*Buteogallus urubitinga*

Birds

	Camp Amuku	Camp Monkey Jump	Camp New River	Total (15 days)	Travel	IUCN Red List (2024)	CITES Appendices
	1	2	5	8	–	–	Appendix II
	–	–	1	1	–	–	–
	–	1	–	1	–	–	Appendix II
	3	1	4	8	–	–	Appendix II
	3	3	3	9	–	–	Appendix II
	2	1	–	3	–	–	Appendix II
	x	–	–	x	–	–	–
	–	–	–	–	x	–	–
	4	4	5	13	–	–	–
	–	2	–	2	x	–	–
	–	–	–	–	x	–	–
	–	3	–	3	–	–	–
	1	1	–	2	x	Vulnerable	–
	1	–	–	1	x	–	–
	–	–	–	–	x	Near Threatened	–
	–	–	–	–	x	–	–
	–	1	–	1	–	–	–
	1	1	1	3	x	–	–
	–	–	–	–	x	–	–
	–	–	1	1	x	–	–
	3	–	2	5	–	–	–
	eDNA	–	–	eDNA	–	–	–
	x	–	–	x	x	Near Threatened	–
	–	–	–	–	x	–	–
	–	–	–	–	x	–	–
	–	–	–	–	x	–	–
	–	–	–	–	x	–	–
	–	–	–	–	x	–	–
	–	1	3	4	x	–	–
	1	1	1	3	x	–	–
	1	1	2	4	x	–	Appendix III
	2	4	3	9	–	–	–
	3	4	4	11	–	–	–
	1	–	5	6	x	–	Appendix II
	–	–	–	–	x	–	Appendix II
	–	–	–	–	x	–	Appendix II
	–	–	1	1	x	Near Threatened	Appendix II
	–	–	–	–	x	Vulnerable	Appendix I
	–	–	1	1	–	–	Appendix II
	3	2	4	9	–	Near Threatened	Appendix II
	–	–	1	1	x	–	Appendix II
	1	1	3	5	x	–	Appendix II

Appendix 6

Birds

Family	Common name	Scientific name	
Accipitridae (Hawks, Eagles, and Kites)	Roadside Hawk	*Rupornis magnirostris*	
Accipitridae (Hawks, Eagles, and Kites)	White Hawk	*Pseudastur albicollis*	
Accipitridae (Hawks, Eagles, and Kites)	Black-faced Hawk	*Leucopternis melanops*	
Strigidae (Owls)	Tawny-bellied Screech-Owl	*Megascops watsonii*	
Strigidae (Owls)	Crested Owl	*Lophostrix cristata*	
Strigidae (Owls)	Spectacled Owl	*Pulsatrix perspicillata*	
Strigidae (Owls)	Amazonian Pygmy-Owl	*Glaucidium hardyi*	
Strigidae (Owls)	Mottled Owl	*Strix virgata*	
Trogonidae (Trogons)	Black-tailed Trogon	*Trogon melanurus*	
Trogonidae (Trogons)	Green-backed Trogon	*Trogon viridis*	
Trogonidae (Trogons)	Guianan Trogon	*Trogon violaceus*	
Trogonidae (Trogons)	Amazonian Black-throated Trogon	*Trogon rufus*	
Trogonidae (Trogons)	Collared Trogon	*Trogon collaris*	
Momotidae (Motmots)	Amazonian Motmot	*Momotus momota*	
Alcedinidae (Kingfishers)	Ringed Kingfisher	*Megaceryle torquata*	
Alcedinidae (Kingfishers)	Amazon Kingfisher	*Chloroceryle amazona*	
Alcedinidae (Kingfishers)	American Pygmy Kingfisher	*Chloroceryle aenea*	
Alcedinidae (Kingfishers)	Green Kingfisher	*Chloroceryle americana*	
Alcedinidae (Kingfishers)	Green-and-rufous Kingfisher	*Chloroceryle inda*	
Bucconidae (Puffbirds)	Guianan Puffbird	*Notharchus macrorhynchos*	
Bucconidae (Puffbirds)	Pied Puffbird	*Notharchus tectus*	
Bucconidae (Puffbirds)	Spotted Puffbird	*Bucco tamatia*	
Bucconidae (Puffbirds)	Collared Puffbird	*Bucco capensis*	
Bucconidae (Puffbirds)	White-chested Puffbird	*Malacoptila fusca*	
Bucconidae (Puffbirds)	Rusty-breasted Nunlet	*Nonnula rubecula*	
Bucconidae (Puffbirds)	Black Nunbird	*Monasa atra*	
Bucconidae (Puffbirds)	Swallow-winged Puffbird	*Chelidoptera tenebrosa*	
Galbulidae (Jacamars)	Yellow-billed Jacamar	*Galbula albirostris*	
Galbulidae (Jacamars)	Bronzy Jacamar	*Galbula leucogastra*	
Galbulidae (Jacamars)	Paradise Jacamar	*Galbula dea*	
Galbulidae (Jacamars)	Great Jacamar	*Jacamerops aureus*	
Capitonidae (New World Barbets)	Black-spotted Barbet	*Capito niger*	
Ramphastidae (Toucans)	Tepui Toucanet	*Aulacorhynchus whitelianus*	
Ramphastidae (Toucans)	Green Aracari	*Pteroglossus viridis*	
Ramphastidae (Toucans)	Black-necked Aracari	*Pteroglossus aracari*	
Ramphastidae (Toucans)	Guianan Toucanet	*Selenidera piperivora*	
Ramphastidae (Toucans)	White-throated Toucan	*Ramphastos tucanus*	
Ramphastidae (Toucans)	Channel-billed Toucan	*Ramphastos vitellinus*	
Picidae (Woodpeckers)	Golden-spangled Piculet	*Picumnus exilis*	
Picidae (Woodpeckers)	Yellow-tufted Woodpecker	*Melanerpes cruentatus*	
Picidae (Woodpeckers)	Golden-collared Woodpecker	*Dryobates cassini*	
Picidae (Woodpeckers)	Red-necked Woodpecker	*Campephilus rubricollis*	

Birds

	Camp Amuku	Camp Monkey Jump	Camp New River	Total (15 days)	Travel	IUCN Red List (2024)	CITES Appendices
	1	–	–	1	–	–	Appendix II
	1	–	1	2	x	–	Appendix II
	–	–	1	1	x	–	Appendix II
	1	3	6	10	–	–	Appendix II
	1	2	1	4	–	–	Appendix II
	–	2	–	2	–	–	Appendix II
	2	4	6	12	–	–	Appendix II
	2	1	–	3	–	–	Appendix II
	2	2	3	7	–	–	–
	4	4	4	12	–	–	–
	3	2	5	10	–	–	–
	2	4	2	8	–	–	–
	1	–	–	1	–	–	–
	3	3	6	12	–	–	–
	2	2	1	5	x	–	–
	2	3	4	9	x	–	–
	–	1	–	1	–	–	–
	1	1	2	4	x	–	–
	2	–	1	3	–	–	–
	2	1	2	5	–	–	–
	–	–	4	4	–	–	–
	3	4	4	11	–	–	–
	1	2	3	6	–	–	–
	eDNA	–	–	eDNA	–	–	–
	1	–	–	1	–	–	–
	1	4	5	10	–	–	–
	2	2	3	7	x	–	–
	2	4	6	12	–	–	–
	4	2	–	6	–	–	–
	3	4	6	13	–	–	–
	4	3	6	13	–	–	–
	3	3	5	11	–	–	–
	1	–	–	1	–	–	–
	1	1	1	3	x	–	Appendix II
	1	1	2	4	–	–	Appendix II
	1	–	6	7	–	–	–
	5	4	6	15	–	–	Appendix II
	5	4	6	15	–	–	Appendix II
	2	2	–	4	–	–	–
	1	–	–	1	–	–	–
	2	2	6	10	–	–	–
	4	4	5	13	–	–	–

Appendix 6

Birds

Family	Common name	Scientific name
Picidae (Woodpeckers)	Crimson-crested Woodpecker	*Campephilus melanoleucos*
Picidae (Woodpeckers)	Lineated Woodpecker	*Dryocopus lineatus*
Picidae (Woodpeckers)	Ringed Woodpecker	*Celeus torquatus*
Picidae (Woodpeckers)	Waved Woodpecker	*Celeus undatus*
Picidae (Woodpeckers)	Cream-colored Woodpecker	*Celeus flavus*
Picidae (Woodpeckers)	Chestnut Woodpecker	*Celeus elegans*
Picidae (Woodpeckers)	Yellow-throated Woodpecker	*Piculus flavigula*
Falconidae (Falcons and Caracaras)	Slaty-backed Forest-Falcon	*Micrastur mirandollei*
Falconidae (Falcons and Caracaras)	Barred Forest-Falcon	*Micrastur ruficollis*
Falconidae (Falcons and Caracaras)	Lined Forest-Falcon	*Micrastur gilvicollis*
Falconidae (Falcons and Caracaras)	Red-throated Caracara	*Ibycter americanus*
Falconidae (Falcons and Caracaras)	Black Caracara	*Daptrius ater*
Falconidae (Falcons and Caracaras)	Bat Falcon	*Falco rufigularis*
Psittacidae (New World and African Parrots)	Sapphire-rumped Parrotlet	*Touit purpuratus*
Psittacidae (New World and African Parrots)	Golden-winged Parakeet	*Brotogeris chrysoptera*
Psittacidae (New World and African Parrots)	Caica Parrot	*Pyrilia caica*
Psittacidae (New World and African Parrots)	Dusky Parrot	*Pionus fuscus*
Psittacidae (New World and African Parrots)	Blue-headed Parrot	*Pionus menstruus*
Psittacidae (New World and African Parrots)	Yellow-crowned Parrot	*Amazona ochrocephala*
Psittacidae (New World and African Parrots)	Mealy Parrot	*Amazona farinosa*
Psittacidae (New World and African Parrots)	Orange-winged Parrot	*Amazona amazonica*
Psittacidae (New World and African Parrots)	Black-headed Parrot	*Pionites melanocephalus*
Psittacidae (New World and African Parrots)	Red-fan Parrot	*Deroptyus accipitrinus*
Psittacidae (New World and African Parrots)	Painted Parakeet	*Pyrrhura picta*
Psittacidae (New World and African Parrots)	Red-bellied Macaw	*Orthopsittaca manilatus*
Psittacidae (New World and African Parrots)	Blue-and-yellow Macaw	*Ara ararauna*
Psittacidae (New World and African Parrots)	Chestnut-fronted Macaw	*Ara severus*
Psittacidae (New World and African Parrots)	Scarlet Macaw	*Ara macao*
Psittacidae (New World and African Parrots)	Red-and-green Macaw	*Ara chloropterus*
Psittacidae (New World and African Parrots)	White-eyed Parakeet	*Psittacara leucophthalmus*
Thamnophilidae (Typical Antbirds)	Ash-winged Antwren	*Euchrepomis spodioptila*
Thamnophilidae (Typical Antbirds)	Fasciated Antshrike	*Cymbilaimus lineatus*
Thamnophilidae (Typical Antbirds)	Black-throated Antshrike	*Frederickena viridis*
Thamnophilidae (Typical Antbirds)	Great Antshrike	*Taraba major*
Thamnophilidae (Typical Antbirds)	Black-crested Antshrike	*Sakesphorus canadensis*
Thamnophilidae (Typical Antbirds)	Mouse-colored Antshrike	*Thamnophilus murinus*
Thamnophilidae (Typical Antbirds)	Band-tailed Antshrike	*Thamnophilus melanothorax*
Thamnophilidae (Typical Antbirds)	Amazonian Antshrike	*Thamnophilus amazonicus*
Thamnophilidae (Typical Antbirds)	Dusky-throated Antshrike	*Thamnomanes ardesiacus*
Thamnophilidae (Typical Antbirds)	Cinereous Antshrike	*Thamnomanes caesius*
Thamnophilidae (Typical Antbirds)	Rufous-bellied Antwren	*Isleria guttata*
Thamnophilidae (Typical Antbirds)	Spot-winged Antshrike	*Pygiptila stellaris*

Birds

	Camp Amuku	Camp Monkey Jump	Camp New River	Total (15 days)	Travel	IUCN Red List (2024)	CITES Appendices
	–	–	3	3	–	–	–
	2	2	5	9	–	–	–
	4	1	6	11	–	–	–
	3	4	6	13	–	–	–
	3	2	–	5	–	–	–
	1	3	–	4	–	–	–
	3	4	6	13	–	–	–
	–	–	3	3	–	–	Appendix II
	–	–	2	2	–	–	Appendix II
	5	4	3	12	–	–	Appendix II
	4	3	6	13	–	–	Appendix II
	1	–	3	4	x	–	Appendix II
	–	–	3	3	x	–	Appendix II
	3	–	1	4	–	–	Appendix II
	5	4	6	15	–	–	Appendix II
	3	4	2	9	–	–	Appendix II
	2	4	4	10	–	–	Appendix II
	5	4	6	15	–	–	Appendix II
	–	–	2	2	–	–	Appendix II
	3	2	3	8	–	–	Appendix II
	x	4	4	8	–	–	Appendix II
	2	3	3	8	–	–	Appendix II
	1	2	3	6	–	–	Appendix II
	4	2	2	8	–	–	Appendix II
	1	–	–	1	–	–	Appendix II
	3	4	6	13	–	–	Appendix II
	–	–	1	1	–	–	Appendix II
	1	3	3	7	–	–	Appendix I
	2	2	5	9	–	–	Appendix II
	1	3	5	9	–	–	Appendix II
	2	3	3	8	–	–	–
	3	4	6	13	–	–	–
	1	1	2	4	–	–	–
	–	–	3	3	–	–	–
	–	–	1	1	–	–	–
	5	4	6	15	–	–	–
	–	1	4	5	–	–	–
	4	2	6	12	–	–	–
	5	4	6	15	–	–	–
	5	4	6	15	–	–	–
	2	3	4	9	–	–	–
	4	2	3	9	–	–	–

Appendix 6

Birds

Family	Common name	Scientific name
Thamnophilidae (Typical Antbirds)	Brown-bellied Stipplethroat	*Epinecrophylla gutturalis*
Thamnophilidae (Typical Antbirds)	Pygmy Antwren	*Myrmotherula brachyura*
Thamnophilidae (Typical Antbirds)	Guianan Streaked-Antwren	*Myrmotherula surinamensis*
Thamnophilidae (Typical Antbirds)	White-flanked Antwren	*Myrmotherula axillaris*
Thamnophilidae (Typical Antbirds)	Long-winged Antwren	*Myrmotherula longipennis*
Thamnophilidae (Typical Antbirds)	Gray Antwren	*Myrmotherula menetriesii*
Thamnophilidae (Typical Antbirds)	Spot-tailed Antwren	*Herpsilochmus sticturus*
Thamnophilidae (Typical Antbirds)	Todd's Antwren	*Herpsilochmus stictocephalus*
Thamnophilidae (Typical Antbirds)	Dot-winged Antwren	*Microrhopias quixensis*
Thamnophilidae (Typical Antbirds)	Guianan Warbling-Antbird	*Hypocnemis cantator*
Thamnophilidae (Typical Antbirds)	Dusky Antbird	*Cercomacroides tyrannina*
Thamnophilidae (Typical Antbirds)	Gray Antbird	*Cercomacra cinerascens*
Thamnophilidae (Typical Antbirds)	White-browed Antbird	*Myrmoborus leucophrys*
Thamnophilidae (Typical Antbirds)	Black-chinned Antbird	*Hypocnemoides melanopogon*
Thamnophilidae (Typical Antbirds)	Silvered Antbird	*Sclateria naevia*
Thamnophilidae (Typical Antbirds)	Black-headed Antbird	*Percnostola rufifrons*
Thamnophilidae (Typical Antbirds)	Spot-winged Antbird	*Myrmelastes leucostigma*
Thamnophilidae (Typical Antbirds)	Ferruginous-backed Antbird	*Myrmoderus ferrugineus*
Thamnophilidae (Typical Antbirds)	Black-throated Antbird	*Myrmophylax atrothorax*
Thamnophilidae (Typical Antbirds)	Wing-banded Antbird	*Myrmornis torquata*
Thamnophilidae (Typical Antbirds)	White-plumed Antbird	*Pithys albifrons*
Thamnophilidae (Typical Antbirds)	Rufous-throated Antbird	*Gymnopithys rufigula*
Thamnophilidae (Typical Antbirds)	Spot-backed Antbird	*Hylophylax naevius*
Thamnophilidae (Typical Antbirds)	Common Scale-backed Antbird	*Willisornis poecilinotus*
Grallariidae (Antpittas)	Spotted Antpitta	*Hylopezus macularius*
Grallariidae (Antpittas)	Thrush-like Antpitta	*Myrmothera campanisona*
Formicariidae (Antthrushes)	Rufous-capped Antthrush	*Formicarius colma*
Formicariidae (Antthrushes)	Black-faced Antthrush	*Formicarius analis*
Furnariidae (Ovenbirds and Woodcreepers)	Olivaceous Woodcreeper	*Sittasomus griseicapillus*
Furnariidae (Ovenbirds and Woodcreepers)	Long-tailed Woodcreeper	*Deconychura longicauda*
Furnariidae (Ovenbirds and Woodcreepers)	Plain-brown Woodcreeper	*Dendrocincla fuliginosa*
Furnariidae (Ovenbirds and Woodcreepers)	Wedge-billed Woodcreeper	*Glyphorynchus spirurus*
Furnariidae (Ovenbirds and Woodcreepers)	Cinnamon-throated Woodcreeper	*Dendrexetastes rufigula*
Furnariidae (Ovenbirds and Woodcreepers)	Amazonian Barred-Woodcreeper	*Dendrocolaptes certhia*
Furnariidae (Ovenbirds and Woodcreepers)	Black-banded Woodcreeper	*Dendrocolaptes picumnus*
Furnariidae (Ovenbirds and Woodcreepers)	Red-billed Woodcreeper	*Hylexetastes perrotii*
Furnariidae (Ovenbirds and Woodcreepers)	Striped Woodcreeper	*Xiphorhynchus obsoletus*
Furnariidae (Ovenbirds and Woodcreepers)	Chestnut-rumped Woodcreeper	*Xiphorhynchus pardalotus*
Furnariidae (Ovenbirds and Woodcreepers)	Buff-throated Woodcreeper	*Xiphorhynchus guttatus*
Furnariidae (Ovenbirds and Woodcreepers)	Curve-billed Scythebill	*Campylorhamphus procurvoides*
Furnariidae (Ovenbirds and Woodcreepers)	Guianan Woodcreeper	*Lepidocolaptes albolineatus*
Furnariidae (Ovenbirds and Woodcreepers)	Plain Xenops	*Xenops minutus*

Birds

	Camp Amuku	Camp Monkey Jump	Camp New River	Total (15 days)	Travel	IUCN Red List (2024)	CITES Appendices
	3	4	5	12	–	–	–
	2	4	6	12	–	–	–
	2	3	6	11	–	–	–
	5	4	6	15	–	–	–
	4	3	6	13	–	–	–
	3	4	6	13	–	–	–
	3	4	6	13	–	–	–
	1	4	5	10	–	–	–
	–	–	6	6	–	–	–
	4	4	6	14	–	–	–
	1	3	6	10	–	–	–
	3	4	6	13	–	–	–
	1	–	1	2	–	–	–
	3	4	5	12	–	–	–
	1	1	2	4	–	–	–
	4	4	6	14	–	–	–
	2	4	4	10	–	–	–
	3	4	6	13	–	–	–
	–	4	1	5	–	–	–
	1	1	2	4	–	–	–
	3	3	6	12	–	–	–
	3	4	6	13	–	–	–
	1	3	1	5	–	–	–
	1	3	3	7	–	–	–
	5	3	6	14	–	–	–
	3	3	6	12	–	–	–
	2	3	6	11	–	–	–
	1	3	3	7	–	–	–
	1	–	–	1	–	–	–
	–	1	–	1	–	–	–
	4	4	4	12	–	–	–
	5	4	6	15	–	–	–
	–	–	5	5	–	–	–
	4	4	6	14	–	–	–
	1	1	–	2	–	–	–
	2	2	–	4	–	–	–
	3	3	–	6	–	–	–
	5	4	6	15	–	–	–
	–	–	5	5	–	–	–
	1	2	1	4	–	–	–
	2	4	–	6	–	–	–
	4	3	6	13	–	–	–

Appendix 6

Birds

Family	Common name	Scientific name
Furnariidae (Ovenbirds and Woodcreepers)	Rufous-tailed Xenops	*Microxenops milleri*
Furnariidae (Ovenbirds and Woodcreepers)	Rufous-rumped Foliage-gleaner	*Philydor erythrocercum*
Furnariidae (Ovenbirds and Woodcreepers)	Cinnamon-rumped Foliage-gleaner	*Philydor pyrrhodes*
Furnariidae (Ovenbirds and Woodcreepers)	Ochre-throated Foliage-gleaner	*Automolus ochrolaemus*
Furnariidae (Ovenbirds and Woodcreepers)	Olive-backed Foliage-gleaner	*Automolus infuscatus*
Furnariidae (Ovenbirds and Woodcreepers)	Speckled Spinetail	*Thripophaga gutturata*
Furnariidae (Ovenbirds and Woodcreepers)	Yellow-chinned Spinetail	*Certhiaxis cinnamomeus*
Furnariidae (Ovenbirds and Woodcreepers)	Ruddy Spinetail	*Synallaxis rutilans*
Pipridae (Manakins)	Tiny Tyrant-Manakin	*Tyranneutes virescens*
Pipridae (Manakins)	Saffron-crested Tyrant-Manakin	*Neopelma chrysocephalum*
Pipridae (Manakins)	White-throated Manakin	*Corapipo gutturalis*
Pipridae (Manakins)	Black Manakin	*Xenopipo atronitens*
Pipridae (Manakins)	White-fronted Manakin	*Lepidothrix serena*
Pipridae (Manakins)	White-bearded Manakin	*Manacus manacus*
Pipridae (Manakins)	White-crowned Manakin	*Pseudopipra pipra*
Pipridae (Manakins)	Golden-headed Manakin	*Ceratopipra erythrocephala*
Cotingidae (Cotingas)	Guianan Red-Cotinga	*Phoenicircus carnifex*
Cotingidae (Cotingas)	Crimson Fruitcrow	*Haematoderus militaris*
Cotingidae (Cotingas)	Purple-throated Fruitcrow	*Querula purpurata*
Cotingidae (Cotingas)	Capuchinbird	*Perissocephalus tricolor*
Cotingidae (Cotingas)	Purple-breasted Cotinga	*Cotinga cotinga*
Cotingidae (Cotingas)	Spangled Cotinga	*Cotinga cayana*
Cotingidae (Cotingas)	Screaming Piha	*Lipaugus vociferans*
Cotingidae (Cotingas)	Pompadour Cotinga	*Xipholena punicea*
Tityridae (Tityras and Allies)	Black-tailed Tityra	*Tityra cayana*
Tityridae (Tityras and Allies)	Olivaceous Schiffornis	*Schiffornis olivacea*
Tityridae (Tityras and Allies)	Cinereous Mourner	*Laniocera hypopyrra*
Tityridae (Tityras and Allies)	Black-capped Becard	*Pachyramphus marginatus*
Tityridae (Tityras and Allies)	Glossy-backed Becard	*Pachyramphus surinamus*
Tityridae (Tityras and Allies)	Pink-throated Becard	*Pachyramphus minor*
Oxyruncidae (Sharpbill, Royal Flycatcher, and Allies)	Tropical Royal Flycatcher	*Onychorhynchus coronatus*
Oxyruncidae (Sharpbill, Royal Flycatcher, and Allies)	Ruddy-tailed Flycatcher	*Terenotriccus erythrurus*
Oxyruncidae (Sharpbill, Royal Flycatcher, and Allies)	Whiskered Flycatcher	*Myiobius barbatus*
Tyrannidae (Tyrant Flycatchers)	Wing-barred Piprites	*Piprites chloris*
Tyrannidae (Tyrant Flycatchers)	Cinnamon-crested Spadebill	*Platyrinchus saturatus*
Tyrannidae (Tyrant Flycatchers)	Golden-crowned Spadebill	*Platyrinchus coronatus*
Tyrannidae (Tyrant Flycatchers)	White-crested Spadebill	*Platyrinchus platyrhynchos*
Tyrannidae (Tyrant Flycatchers)	Ochre-bellied Flycatcher	*Mionectes oleagineus*
Tyrannidae (Tyrant Flycatchers)	McConnell's Flycatcher	*Mionectes macconnelli*
Tyrannidae (Tyrant Flycatchers)	Olive-green Tyrannulet	*Phylloscartes virescens*
Tyrannidae (Tyrant Flycatchers)	Ringed Antpipit	*Corythopis torquatus*
Tyrannidae (Tyrant Flycatchers)	Short-tailed Pygmy-Tyrant	*Myiornis ecaudatus*

Birds

	Camp Amuku	Camp Monkey Jump	Camp New River	Total (15 days)	Travel	IUCN Red List (2024)	CITES Appendices
	–	1	–	1	–	–	–
	4	4	4	12	–	–	–
	–	1	1	2	–	–	–
	1	2	3	6	–	–	–
	2	2	–	4	–	–	–
	2	2	–	4	–	–	–
	–	1	–	1	–	–	–
	1	2	–	3	–	–	–
	5	4	6	15	–	–	–
	3	–	–	3	–	–	–
	3	1	1	5	–	–	–
	1	–	–	1	–	–	–
	2	2	–	4	–	–	–
	–	–	1	1	–	–	–
	4	4	3	11	–	–	–
	5	3	5	13	–	–	–
	3	4	1	8	–	–	–
	–	1	–	1	–	–	–
	5	1	5	11	–	–	–
	3	–	2	5	–	–	–
	1	–	–	1	–	–	–
	1	2	–	3	x	–	–
	5	4	6	15	–	–	–
	3	1	2	6	x	–	–
	1	1	3	5	–	–	–
	4	4	–	8	–	–	–
	2	2	2	6	–	–	–
	1	3	–	4	–	–	–
	–	1	1	2	–	–	–
	–	–	1	1	–	–	–
	1	–	2	3	–	–	–
	3	3	5	11	–	–	–
	3	2	4	9	–	–	–
	2	3	1	6	–	–	–
	–	–	1	1	–	–	–
	1	–	6	7	–	–	–
	1	1	4	6	–	–	–
	–	–	1	1	–	–	–
	3	–	3	6	–	–	–
	–	2	1	3	–	–	–
	1	2	–	3	–	–	–
	2	2	6	10	–	–	–

Appendix 6

Birds

Family	Common name	Scientific name
Tyrannidae (Tyrant Flycatchers)	Double-banded Pygmy-Tyrant	*Lophotriccus vitiosus*
Tyrannidae (Tyrant Flycatchers)	Helmeted Pygmy-Tyrant	*Lophotriccus galeatus*
Tyrannidae (Tyrant Flycatchers)	Boat-billed Tody-Tyrant	*Hemitriccus josephinae*
Tyrannidae (Tyrant Flycatchers)	White-eyed Tody-Tyrant	*Hemitriccus zosterops*
Tyrannidae (Tyrant Flycatchers)	Pelzeln's Tody-Tyrant	*Hemitriccus inornatus*
Tyrannidae (Tyrant Flycatchers)	Common Tody-Flycatcher	*Todirostrum cinereum*
Tyrannidae (Tyrant Flycatchers)	Painted Tody-Flycatcher	*Todirostrum pictum*
Tyrannidae (Tyrant Flycatchers)	Eastern Olivaceous Flatbill	*Rhynchocyclus olivaceus*
Tyrannidae (Tyrant Flycatchers)	Yellow-margined Flatbill	*Tolmomyias assimilis*
Tyrannidae (Tyrant Flycatchers)	Gray-crowned Flatbill	*Tolmomyias poliocephalus*
Tyrannidae (Tyrant Flycatchers)	White-lored Tyrannulet	*Ornithion inerme*
Tyrannidae (Tyrant Flycatchers)	Southern Beardless-Tyrannulet	*Camptostoma obsoletum*
Tyrannidae (Tyrant Flycatchers)	Yellow-crowned Tyrannulet	*Tyrannulus elatus*
Tyrannidae (Tyrant Flycatchers)	Forest Elaenia	*Myiopagis gaimardii*
Tyrannidae (Tyrant Flycatchers)	Amazonian Elaenia	*Myiopagis cinerea*
Tyrannidae (Tyrant Flycatchers)	Guianan Tyrannulet	*Zimmerius acer*
Tyrannidae (Tyrant Flycatchers)	Euler's Flycatcher	*Lathrotriccus euleri*
Tyrannidae (Tyrant Flycatchers)	Drab Water Tyrant	*Ochthornis littoralis*
Tyrannidae (Tyrant Flycatchers)	Long-tailed Tyrant	*Colonia colonus*
Tyrannidae (Tyrant Flycatchers)	Rufous-tailed Flatbill	*Ramphotrigon ruficauda*
Tyrannidae (Tyrant Flycatchers)	Cinnamon Attila	*Attila cinnamomeus*
Tyrannidae (Tyrant Flycatchers)	Bright-rumped Attila	*Attila spadiceus*
Tyrannidae (Tyrant Flycatchers)	Todd's Sirystes	*Sirystes subcanescens*
Tyrannidae (Tyrant Flycatchers)	Grayish Mourner	*Rhytipterna simplex*
Tyrannidae (Tyrant Flycatchers)	Dusky-capped Flycatcher	*Myiarchus tuberculifer*
Tyrannidae (Tyrant Flycatchers)	Short-crested Flycatcher	*Myiarchus ferox*
Tyrannidae (Tyrant Flycatchers)	Great Kiskadee	*Pitangus sulphuratus*
Tyrannidae (Tyrant Flycatchers)	Rusty-margined Flycatcher	*Myiozetetes cayanensis*
Tyrannidae (Tyrant Flycatchers)	Yellow-throated Flycatcher	*Conopias parvus*
Tyrannidae (Tyrant Flycatchers)	Piratic Flycatcher	*Legatus leucophaius*
Tyrannidae (Tyrant Flycatchers)	Tropical Kingbird	*Tyrannus melancholicus*
Vireonidae (Vireos, Shrike-Babblers, and Erpornis)	Lemon-chested Greenlet	*Hylophilus thoracicus*
Vireonidae (Vireos, Shrike-Babblers, and Erpornis)	Slaty-capped Shrike-Vireo	*Vireolanius leucotis*
Vireonidae (Vireos, Shrike-Babblers, and Erpornis)	Tawny-crowned Greenlet	*Tunchiornis ochraceiceps*
Vireonidae (Vireos, Shrike-Babblers, and Erpornis)	Buff-cheeked Greenlet	*Pachysylvia muscicapina*
Vireonidae (Vireos, Shrike-Babblers, and Erpornis)	Tepui Vireo	*Vireo sclateri*
Vireonidae (Vireos, Shrike-Babblers, and Erpornis)	Chivi Vireo	*Vireo chivi*
Vireonidae (Vireos, Shrike-Babblers, and Erpornis)	Black-whiskered Vireo	*Vireo altiloquus*
Corvidae (Crows, Jays, and Magpies)	Cayenne Jay	*Cyanocorax cayanus*
Hirundinidae (Swallows)	White-winged Swallow	*Tachycineta albiventer*
Hirundinidae (Swallows)	Gray-breasted Martin	*Progne chalybea*
Hirundinidae (Swallows)	Brown-chested Martin	*Progne tapera*

Birds

	Camp Amuku	Camp Monkey Jump	Camp New River	Total (15 days)	Travel	IUCN Red List (2024)	CITES Appendices
	5	4	6	15	–	–	–
	–	–	2	2	–	–	–
	–	–	1	1	–	–	–
	3	1	2	6	–	–	–
	1	–	–	1	–	–	–
	–	–	1	1	–	–	–
	2	3	4	9	–	–	–
	2	1	3	6	–	–	–
	5	4	6	15	–	–	–
	1	4	5	10	–	–	–
	3	4	6	13	–	–	–
	1	1	2	4	–	–	–
	4	4	5	13	–	–	–
	5	4	6	15	–	–	–
	3	3	–	6	–	–	–
	5	4	5	14	–	–	–
	1	–	2	3	–	–	–
	–	–	–	–	x	–	–
	–	–	2	2	–	–	–
	5	3	3	11	–	–	–
	–	3	4	7	–	–	–
	3	4	6	13	–	–	–
	–	1	–	1	–	–	–
	5	4	6	15	–	–	–
	5	2	3	10	–	–	–
	–	2	1	3	x	–	–
	1	–	1	2	x	–	–
	1	–	5	6	–	–	–
	4	4	2	10	–	–	–
	3	–	1	4	x	–	–
	2	2	2	6	x	–	–
	5	4	4	13	–	–	–
	1	2	2	5	–	–	–
	4	3	5	12	–	–	–
	5	4	6	15	–	–	–
	1	–	–	1	–	–	–
	1	1	3	5	–	–	–
	–	1	–	1	–	–	–
	–	2	–	2	–	–	–
	1	2	5	8	x	–	–
	–	–	1	1	–	–	–
	2	1	2	5	x	–	–

Appendix 6

Birds

Family	Common name	Scientific name
Hirundinidae (Swallows)	White-banded Swallow	*Atticora fasciata*
Hirundinidae (Swallows)	Black-collared Swallow	*Pygochelidon melanoleuca*
Hirundinidae (Swallows)	Barn Swallow	*Hirundo rustica*
Polioptilidae (Gnatcatchers)	Collared Gnatwren	*Microbates collaris*
Polioptilidae (Gnatcatchers)	Long-billed Gnatwren	*Ramphocaenus melanurus*
Polioptilidae (Gnatcatchers)	Guianan Gnatcatcher	*Polioptila guianensis*
Troglodytidae (Wrens)	Coraya Wren	*Pheugopedius coraya*
Troglodytidae (Wrens)	Buff-breasted Wren	*Cantorchilus leucotis*
Troglodytidae (Wrens)	White-breasted Wood-Wren	*Henicorhina leucosticta*
Troglodytidae (Wrens)	Musician Wren	*Cyphorhinus arada*
Turdidae (Thrushes and Allies)	White-necked Thrush	*Turdus albicollis*
Fringillidae (Finches, Euphonias, and Allies)	Golden-bellied Euphonia	*Euphonia chrysopasta*
Fringillidae (Finches, Euphonias, and Allies)	White-vented Euphonia	*Euphonia minuta*
Fringillidae (Finches, Euphonias, and Allies)	Violaceous Euphonia	*Euphonia violacea*
Fringillidae (Finches, Euphonias, and Allies)	Golden-sided Euphonia	*Euphonia cayennensis*
Passerellidae (New World Sparrows)	Pectoral Sparrow	*Arremon taciturnus*
Icteridae (Troupials and Allies)	Green Oropendola	*Psarocolius viridis*
Icteridae (Troupials and Allies)	Crested Oropendola	*Psarocolius decumanus*
Icteridae (Troupials and Allies)	Yellow-rumped Cacique	*Cacicus cela*
Icteridae (Troupials and Allies)	Red-rumped Cacique	*Cacicus haemorrhous*
Icteridae (Troupials and Allies)	Epaulet Oriole	*Icterus cayanensis*
Icteridae (Troupials and Allies)	Giant Cowbird	*Molothrus oryzivorus*
Parulidae (New World Warblers)	Northern Waterthrush	*Parkesia noveboracensis*
Parulidae (New World Warblers)	Tropical Parula	*Setophaga pitiayumi*
Parulidae (New World Warblers)	Riverbank Warbler	*Myiothlypis rivularis*
Mitrospingidae (Mitrospingid Tanagers)	Red-billed Pied Tanager	*Lamprospiza melanoleuca*
Cardinalidae (Cardinals and Allies)	Yellow-green Grosbeak	*Caryothraustes canadensis*
Cardinalidae (Cardinals and Allies)	Rose-breasted Chat	*Granatellus pelzelni*
Cardinalidae (Cardinals and Allies)	Amazonian Grosbeak	*Cyanoloxia rothschildii*
Thraupidae (Tanagers and Allies)	Red-capped Cardinal	*Paroaria gularis*
Thraupidae (Tanagers and Allies)	Flame-crested Tanager	*Loriotus cristatus*
Thraupidae (Tanagers and Allies)	White-shouldered Tanager	*Loriotus luctuosus*
Thraupidae (Tanagers and Allies)	Fulvous-crested Tanager	*Tachyphonus surinamus*
Thraupidae (Tanagers and Allies)	Fulvous Shrike-Tanager	*Lanio fulvus*
Thraupidae (Tanagers and Allies)	Silver-beaked Tanager	*Ramphocelus carbo*
Thraupidae (Tanagers and Allies)	Blue-backed Tanager	*Cyanicterus cyanicterus*
Thraupidae (Tanagers and Allies)	Palm Tanager	*Thraupis palmarum*
Thraupidae (Tanagers and Allies)	Spotted Tanager	*Ixothraupis punctata*
Thraupidae (Tanagers and Allies)	Turquoise Tanager	*Tangara mexicana*
Thraupidae (Tanagers and Allies)	Opal-rumped Tanager	*Tangara velia*
Thraupidae (Tanagers and Allies)	Swallow Tanager	*Tersina viridis*
Thraupidae (Tanagers and Allies)	Black-faced Dacnis	*Dacnis lineata*

Birds

	Camp Amuku	Camp Monkey Jump	Camp New River	Total (15 days)	Travel	IUCN Red List (2024)	CITES Appendices
	1	–	4	5	x	–	–
	2	–	–	2	x	–	–
	1	1	–	2	x	–	–
	–	–	1	1	–	–	–
	5	4	5	14	–	–	–
	1	1	–	2	–	–	–
	1	4	6	11	–	–	–
	–	–	2	2	–	–	–
	5	2	5	12	–	–	–
	2	3	4	9	–	–	–
	5	3	1	9	–	–	–
	1	–	1	2	–	–	–
	1	–	–	1	–	–	–
	1	–	1	2	–	–	–
	5	3	5	13	–	–	–
	1	1	1	3	–	–	–
	5	3	4	12	–	–	–
	1	–	5	6	x	–	–
	3	–	6	9	x	–	–
	2	4	3	9	–	–	–
	1	3	2	6	–	–	–
	2	3	2	7	x	–	–
	1	–	–	1	–	–	–
	1	–	–	1	–	–	–
	1	2	2	5	–	–	–
	–	1	2	3	–	–	–
	4	4	1	9	–	–	–
	1	1	–	2	–	–	–
	3	2	4	9	–	–	–
	3	–	2	5	x	–	–
	–	3	–	3	–	–	–
	1	–	2	3	–	–	–
	2	4	5	11	–	–	–
	1	–	2	3	–	–	–
	–	–	4	4	–	–	–
	1	–	–	1	–	–	–
	–	3	3	6	–	–	–
	1	–	–	1	–	–	–
	–	–	2	2	–	–	–
	1	–	–	1	–	–	–
	–	1	2	3	–	–	–
	–	1	1	2	–	–	–

Appendix 6

Birds

Family	Common name	Scientific name	
Thraupidae (Tanagers and Allies)	Blue Dacnis	*Dacnis cayana*	
Thraupidae (Tanagers and Allies)	Short-billed Honeycreeper	*Cyanerpes nitidus*	
Thraupidae (Tanagers and Allies)	Purple Honeycreeper	*Cyanerpes caeruleus*	
Thraupidae (Tanagers and Allies)	Red-legged Honeycreeper	*Cyanerpes cyaneus*	
Thraupidae (Tanagers and Allies)	Green Honeycreeper	*Chlorophanes spiza*	
Thraupidae (Tanagers and Allies)	Yellow-backed Tanager	*Hemithraupis flavicollis*	
Thraupidae (Tanagers and Allies)	Chestnut-bellied Seed-Finch	*Sporophila angolensis*	
Thraupidae (Tanagers and Allies)	Bananaquit	*Coereba flaveola*	
Thraupidae (Tanagers and Allies)	Buff-throated Saltator	*Saltator maximus*	
Thraupidae (Tanagers and Allies)	Slate-colored Grosbeak	*Saltator grossus*	
Summed totals = 339			

Birds

	Camp Amuku	Camp Monkey Jump	Camp New River	Total (15 days)	Travel	IUCN Red List (2024)	CITES Appendices
	1	1	3	5	–	–	–
	–	1	1	2	–	–	–
	1	2	1	4	x	–	–
	–	2	1	3	x	–	–
	–	1	2	3	–	–	–
	1	2	–	3	–	–	–
	–	1	–	1	x	–	–
	2	2	4	8	–	–	–
	–	–	2	2	–	–	–
	1	1	6	8	–	–	–
	250	**233**	**254**	**323**			

Mammals

Mammal species recorded during a rapid inventory of the Acarai-Corentyne Corridor in southern Guyana by Farah Carrasco-Rueda, Matthew T. Hallett, Arianne-Elise Harris, Huichang Yang, Alex Stewart, Octavious Hendricks, Wenceslaus Washington, Phillip Suse, and Sampson Yaimo. Mammals were recorded using a variety of sampling methods: camera trapping between 17 October and 21 November 2024; trail surveys, mist-nets, and audio recordings on 6–21 November 2024; environmental DNA; and opportunistic observations by the rapid inventory team between 17 October and 21 November 2024.

Scientific name	Common name	Local names in Indigenous languages			
		Waiwai	Wapichan	Trio	
DIDELPHIMORPHIA					
Didelphidae					
Caluromys philander	Bare-tailed Woolly opossum	–	–	–	
Didelphis marsupialis	Common opossum	Yawari	Yawari	Aware	
Gracilinanus emiliae	Emilia's Gracile opossum	–	–	–	
Marmosops sp.	Slender opossum	–	–	–	
Marmosa demerarae	–	–	–	–	
Marmosa sp.	Woolly mouse opossum	–	–	–	
Metachirus nudicaudatus	Brown four-eyed opossum	–	–	–	
Monodelphis brevicaudata	Northern red-sided opossum	–	–	–	
Philander opossum	Gray four-eyed opossum	–	–	–	
Didelphidae sp.	Gray four-eyed opossum / Brown four-eyed opossum	–	Wasi	–	
CINGULATA					
Dasypodidae					
Cabassous unicinctus	Southern naked-tailed armadillo	Morke	Kabazibari	Kapai pisi	
Dasypus guianensis	Guianan long-nosed armadillo	Kapayo	Dawudiu	Mocaimé	
Dasypus kappleri	Great long-nosed armadillo	–	Witt	Kapai	
Dasypus sp.	–	–	–	–	
Chlamyphoridae					
Priodontes maximus	Giant armadillo	Murura	Maroro	–	
PILOSA					
Bradypodidae					
Bradypus tridactylus	Pale-throated three-toed sloth	Xori	Aau	Wirinai	
Myrmecophagidae					
Myrmecophaga tridactyla	Giant anteater	Amaci	Tamanuwa	Masiwi	
Tamandua tetradactyla	Southern tamandua	Waxi	Wushu	Wariime	
PRIMATES					
Cebidae					
Saguinus midas	Golden-handed tamarin	Wiicaru	Wicharu	Makui	
Sapajus apella	Brown capuchin	Meekú	Powat	Taripi	
Cebus olivaceus	Wedge-capped capuchin	Warakarú	Owaa'o	Akau	
Saimiri sciureus	Guianan squirrel monkey	Cakarma	Chima	Akariman	

Appendix 7

Mammals

	Conservation status			Records at each site			Acarai-Corentyne Corridor
	IUCN (2024)	CITES	GWCMC	Camp Amuku	Camp Monkey Jump	Camp New River	
	LC	–	–	–	–	–	E
	LC	–	–	CT	CT	CT, O1	–
	DD	–	–	–	–	E	–
	–	–	–	O1	–	–	–
	–	–	–	–	–	–	E
	–	–	–	–	CT	–	–
	LC	–	–	E	–	–	–
	LC	–	–	–	E	–	–
	LC	–	–	–	E	–	–
	LC	–	–	–	CT	CT, O1, E	–
	LC	–	Protected - Part III Vulnerable	–	–	CT	–
	–	–	Managed*	CT	CT	CT	–
	LC	–	Managed	CT	CT	CT	E
	–	–	–	T2, O2	T2, O2	T2, O2	–
	VU	I	Protected - Part III Vulnerable	CT, T2, O2	CT, E	CT, O2	–
	LC	–	–	–	O1, E	–	–
	VU	II	Protected - Part III Vulnerable	CT, T2, E	CT, T2, O1, E	CT, E	–
	LC	–	Managed	T2	E	CT, E	–
	LC	II	Managed	T1, O1	O1	O1	E
	LC	II	Managed	CT, T1, O1, E	CT, T1, O1, E	CT, O1, E	–
	LC	II	Managed	CT, T1, O1	CT, O1	CT, O1	E
	LC	II	Managed	O1, E	T1, O1	O1	–

LEGEND

Records

1 = Direct observation (live sighting or carcass)

2 = Tracks and signs (burrow, feces, feeding, scratches, wallow)

3 = Vocalization

CT = Camera trap

E = eDNA

O = Opportunistic sighting

T = Transect

R = Recording

Status

DD = Data Deficient

EN = Endangered

I = CITES Appendix I

II = CITES Appendix II

III = CITES Appendix III

LC = Least Concern

NT = Near Threatened

VU = Vulnerable

*Listed as *Dasypus novemcinctus*

Appendix 7

Mammals

Scientific name	Common name	Local names in Indigenous languages		
		Waiwai	Wapichan	Trio
Pitheciidae				
Chiropotes sagulatus	Reddish-brown bearded saki	Uxaa	Wishi	Isoimë
Pithecia pithecia	White-faced saki	Uruwa	Oroo	Ariki
Atelidae				
Alouatta macconnelli	Red howler monkey	Xîpîrî	Suburu	Alawata
Ateles paniscus	Red-faced black spider monkey	Porotó	Romi	Arimi
RODENTIA				
Sciuridae				
Sciurus aestuans	Guianan squirrel	Awarku	Wichawaro	Meri
Cricetidae				
Hylaeamys megacephalus	Large-headed rice rat	–	–	–
Hylaeamys yunganus	Amazonian marsh rice rat	–	–	–
Nectomys rattus	Small-footed bristly mouse	–	–	–
Oecomys bicolor	Bicolored arboreal rice rat	–	–	–
Oecomys concolor	Natterer's oecomys	–	–	–
Oecomys rutilus	Red arboreal rice rat	–	–	–
Erethizontidae				
Coendou prehensilis	Brazilian porcupine	Wara	Ziiwayro	Muri
Coendou sp.	Porcupine	–	–	–
Caviidae				
Hydrochoerus hydrochaeris	Capybara	Yîwîrî	Kashu	Iwiri
Dasyproctidae				
Dasyprocta leporina	Red-rumped agouti	Akri	Sokoro	Akuri
Myoprocta acouchy	Red acouchy	Paxki	Adori	Pasinore
Cuniculidae				
Cuniculus paca	Lowland paca	Wiira	Oran	Kurimau
Echimyidae				
Makalata didelphoides	Brazilian spiny tree-rat	–	–	–
Mesomys hispidus	Ferreira's Spiny Tree-rat	–	–	–
Proechimys sp. *(Proechimys cuvieri* or *Proechimys hoplomyoides)*	Cuvier's spiny rat or Guianan spiny rat	Cawa, mokuku, mînpo	Korii	–
CHIROPTERA				
Emballonuridae				
Cormura brevirostris	Chestnut sac-winged bat	Rere	Tamarïo	Neere
Diclidurus scutatus	Lesser ghost bat	Rere	Tamarïo	Neere
Peropteryx macrotis	Dog-like bat	Rere	Tamarïo	Neere
Peropteryx sp.	Lesser dog-like bat	Rere	Tamarïo	Neere
Rhynchonycteris naso	Proboscis bat	Rere	Tamarïo	Neere
Saccopteryx bilineata	Greater sac-winged bat	Rere	Tamarïo	Neere
Saccopteryx leptura	Lesser sac-winged bat	Rere	Tamarïo	Neere

Mammals

	Conservation status			Records at each site			Acarai-Corentyne Corridor
	IUCN (2024)	CITES	GWCMC	Camp Amuku	Camp Monkey Jump	Camp New River	
	LC	II	–	T1,2, O1	T1, E	T1, O1	–
	LC	II	–	O1, E	O1	–	–
	LC	II	–	O1,3	O3, E	O3, E	–
	VU	II	Protected - Part III Vulnerable	T3, O1	T1,3, O1, E	O1, O3, E	E
	LC	–	–	CT, O1	–	O1	E
	LC	–	–	–	E	–	–
	–	–	–	–	–	–	E
	–	–	–	–	E	–	–
	LC	–	–	–	E	–	–
	LC	–	–	E	–	E	–
	LC	–	–	–	–	E	–
	LC	–	Managed	–	–	O1	–
	–	–	–	E	–	–	–
	LC	–	Managed	E	O1	O1	–
	LC	–	Managed	CT, T1, O1	CT, O1	CT, O1	E
	LC	–	–	CT, T1, O1, E	CT, E	CT, O1	–
	LC	III	Managed	CT, T2, E	CT, O1, E	CT, T2, O1	–
	–	–	–	E	E	E	–
	LC	–	–	–	–	E	–
	–	–	–	CT, O1	CT	CT	–
	LC	–	–	R	E	–	–
	LC	–	–	–	–	–	E
	LC	–	–	–	E	–	–
	–	–	–	–	R	–	–
	LC	–	–	R, E	O1	E	–
	LC	–	–	R	R	R	–
	LC	–	–	R	R	–	–

LEGEND

Records

1 = Direct observation (live sighting or carcass)

2 = Tracks and signs (burrow, feces, feeding, scratches, wallow)

3 = Vocalization

CT = Camera trap

E = eDNA

O = Opportunistic sighting

T = Transect

R = Recording

Status

DD = Data Deficient

EN = Endangered

I = CITES Appendix I

II = CITES Appendix II

III = CITES Appendix III

LC = Least Concern

NT = Near Threatened

VU = Vulnerable

Appendix 7

Mammals

Scientific name	Common name	Local names in Indigenous languages			
		Waiwai	Wapichan	Trio	
Phyllostomidae					
Artibeus planirostris	Flat-faced fruit-eating bat	Rere	Tamarïo	Neere	
Artibeus sp.	Neotropical fruit bats	Rere	Tamarïo	Neere	
Carollia perspicillata	Seba's Short-tailed bat	Rere	Tamarïo	Neere	
Chrotopterus auritus	Woolly false vampire bat	Rere	Iizainik	Neere	
Dermanura glauca	Silver fruit-eating bat	Rere	Tamarïo	Neere	
Lophostoma silvicola	White-throated round-eared bat	Rere	Baraksararan	Neere	
Macrophyllum macrophyllum	Long-legged bat	Rere	Tamarïo	Neere	
Phyllostomus elongatus	Lesser spear-nosed bat	Rere	Tamarïo	Neere	
Phyllostomus sp.	Spear-nosed bat	Rere	Tamarïo	Neere	
Platyrrhinus sp.	Broad-nosed bat	Rere	Tamarïo	Neere	
Trachops cirrhosus	Fringe-lipped bat	Rere	Tamarïo	Neere	
Uroderma bilobatum	Tent-making bat	Rere	Tamarïo	Neere	
Stenodermatinae sp. *(Dermanura* sp. or *Mesophylla macconnelli)*	Macconnell's bat	Rere	Tamarïo	Neere	
Mormoopidae					
Pteronotus parnellii	Parnell's mustached bat	Rere	Tamarïo	Neere	
Noctilionidae					
Noctilio leporinus	Greater bulldog bat	Rere	Kopannik	Neere	
Molossidae					
Eumops 18–25kHz**	Free-tailed bat	Rere	Tamarïo	Neere	
Molossidae 20kHz	Free-tailed bat	Rere	Tamarïo	Neere	
Molossidae 25kHz	Free-tailed bat	Rere	Tamarïo	Neere	
Molossidae 25–25kHz	Free-tailed bat	Rere	Tamarïo	Neere	
Molossidae 30–40kHz	Free-tailed bat	Rere	Tamarïo	Neere	
Promops centralis	Big crested mastiff bat	Rere	Tamarïo	Neere	
Vespertilionidae					
Myotis riparius	Riparian Myotis	Rere	Tamarïo	Neere	
Vespertilionidae 40–45kHz	–	Rere	Tamarïo	Neere	
Vespertilionidae 45kHz	–	Rere	Tamarïo	Neere	
Vespertilionidae 60kHz	–	Rere	Tamarïo	Neere	
CARNIVORA					
Felidae					
Herpailurus yagouaroundi	Jaguarundi	Woroko	Sokorodin	–	
Leopardus pardalis	Ocelot	Irikwa	–	Tokorori	
Leopardus wiedii	Margay	Sosoruchi	Kosowai	–	
Leopardus sp.	–	–	–	–	
Panthera onca	Jaguar	Kamara	Baudukoro	Moono kaikui	
Puma concolor	Puma	Kosowarai	Koshardin	Alawatara	
Canidae					
Speothos venaticus	Bush dog	–	Wiichawaro	–	

Mammals

	Conservation status			Records at each site			Acarai-Corentyne Corridor
	IUCN (2024)	CITES	GWCMC	Camp Amuku	Camp Monkey Jump	Camp New River	
	LC	–	–	E	–	–	–
	–	–	–	–	–	E	–
	LC	–	–	–	E	–	–
	LC	–	–	–	–	C	–
	LC	–	–	E	–	–	–
	LC	–	–	C	–	–	–
	LC	–	–	–	–	–	E
	LC	–	–	C	–	C	–
	–	–	–	–	–	–	E
	–	–	–	–	–	E	–
	LC	–	–	E	–	–	–
	LC	–	–	–	E	–	–
	LC	–	–	–	O1	–	–
	LC	–	–	C	–	–	–
	LC	–	–	–	R	–	E
	–	–	–	R	R	R	–
	–	–	–	–	R	–	–
	–	–	–	R	–	–	–
	–	–	–	R	R	R	–
	–	–	–	R	–	R	–
	LC	–	–	R	–	R	–
	LC	–	–	E	–	–	–
	–	–	–	R	–	–	–
	–	–	–		R	–	–
	–	–	–	R	–	–	–
	LC	II	Protected - Part III Vulnerable	–	CT	–	–
	LC	I	Protected - Part III Vulnerable	CT, O2	E	CT, O2	–
	NT	I	Protected - Part III Vulnerable	CT	CT	CT, O2	–
	–	–	–	E	–	–	–
	NT	I	Protected - Part III Vulnerable	CT1, T2, O1	O1	CT, O1	–
	LC	II	Protected - Part III Vulnerable	CT, O1	CT, O1, E	–	–
	NT	I	Protected - Part III Vulnerable	–	–	O2	–

LEGEND

Records

1 = Direct observation (live sighting or carcass)

2 = Tracks and signs (burrow, feces, feeding, scratches, wallow)

3 = Vocalization

CT = Camera trap

E = eDNA

O = Opportunistic sighting

T = Transect

R = Recording

Status

DD = Data Deficient

EN = Endangered

I = CITES Appendix I

II = CITES Appendix II

III = CITES Appendix III

LC = Least Concern

NT = Near Threatened

VU = Vulnerable

Appendix 7

Mammals

Scientific name	Common name	Local names in Indigenous languages			
		Waiwai	Wapichan	Trio	
Mustelidae					
Lontra longicaudis	Neotropical otter	Saroro	Sorosodi	Saro	
Pteronura brasiliensis	Giant river otter	Wayawaya	Saro	Yawi	
Eira barbara	Tayra	Winayko	Niniro	Wariimë	
Procyonidae					
Nasua nasua	South American coati	Xoowu	Kowachi	Seu	
Potos flavus	Kinkajou	Karimuxu	Shishipu	–	
Procyon cancrivorus	Crab-eating raccoon	–	–	–	
PERISSODACTYLA					
Tapiridae					
Tapirus terrestris	Lowland tapir, Brazilian tapir	Yaipi	Kodoi	Poi	
ARTIODACTYLA					
Tayassuidae					
Dicotyles tajacu	Collared peccary	Pakra	Bakuku	Pakira	
Tayassu pecari	White-lipped peccary	Poniko	Bichi	Ponjeke	
Tayassuidae sp. (*Dicotyles tajacu* or *Tayassu pecari*)	Collared peccary or White-lipped peccary	–	–	–	
Cervidae					
Mazama americana	Red brocket deer	Koso	Koshara	Wikapau	
Mazama nemorivaga	Amazonian brown brocket deer	Pixkaru	Sowai	–	
Mazama sp. *(Mazama nemorivaga* or *Mazama americana)*	Amazonian brown brocket deer or Red brocket deer	–	–	–	

Mammals

	Conservation status			Records at each site			Acarai-Corentyne Corridor
	IUCN (2024)	CITES	GWCMC	Camp Amuku	Camp Monkey Jump	Camp New River	
	NT	I	Protected - Part III Vulnerable	O1	E	–	–
	EN	I	Protected - Part II Endangered	O1, E	O1, E	O1,2	E
	LC	III	–	CT, O1	CT	CT, T1, O1	–
	LC	–	–	CT, O1	CT, O1	CT	E
	LC	III	Managed	–	O1	E	–
	LC	–	–	CT	–	–	–
	VU	II	–	CT, T2, O1,2, E	CT, T1,2, O1,2, E	CT, T2, O1,2, E	–
	LC	II	–	CT, T1,2, O1,2, E	CT, O1,2, E	CT, O1,2, E	–
	VU	II	–	CT, T1,2, O1,2, E	CT, T2, E	CT, O1,2, E	–
	–	–	–	T2, O2	T2	T2, O2	–
	DD	–	Managed	CT, T2, O1	CT, O1	CT, O1,2	E
	LC	–	–	CT	CT	CT, O2	–
	–	–	–	T2, O2	T2, O2	T2	–

LEGEND

Records

1 = Direct observation (live sighting or carcass)

2 = Tracks and signs (burrow, feces, feeding, scratches, wallow)

3 = Vocalization

CT = Camera trap

E = eDNA

O = Opportunistic sighting

T = Transect

R = Recording

Status

DD = Data Deficient

EN = Endangered

I = CITES Appendix I

II = CITES Appendix II

III = CITES Appendix III

LC = Least Concern

NT = Near Threatened

VU = Vulnerable

Environmental DNA

Vertebrate taxa detected in 96 aquatic samples collected during a rapid inventory of the Acarai-Correntyne Corridor in November 2024 and analyzed subsequently using environmental DNA methods. Taxa with 'Novaseq' in the 'Sequence origin' column were detected in the Novaseq sequencing analysis of all 97 filters in March 2025, Chicago, USA. Taxa with 'MinION' in the 'Sequence origin' column were detected in the MinION analysis of a subset of 18 filters in November 2024 at the University of Guyana in Georgetown, Guyana. For details see the *Environmental DNA* chapter on page 151.

Class	Order	Family	Taxon	Sequence origin
Actinopteri	Acanthuriformes	Sciaenidae	*Petilipinnis grunniens*	Novaseq
Actinopteri	Acanthuriformes	Sciaenidae	*Plagioscion squamosissimus*	Novaseq
Actinopteri	Characiformes	Acestrorhynchidae	*Acestrorhynchus falcatus*	Novaseq
Actinopteri	Characiformes	Acestrorhynchidae	*Acestrorhynchus microlepis*	Novaseq
Actinopteri	Characiformes	Acestrorhynchidae	*Acestrorhynchus*	Novaseq
Actinopteri	Characiformes	Anostomidae	*Anostomus ternetzi*	Novaseq
Actinopteri	Characiformes	Anostomidae	*Laemolyta proxima*	Novaseq
Actinopteri	Characiformes	Anostomidae	*Leporinus fasciatus*	Novaseq
Actinopteri	Characiformes	Anostomidae	*Leporinus friderici*	Novaseq
Actinopteri	Characiformes	Anostomidae	*Leporinus granti*	Novaseq
Actinopteri	Characiformes	Anostomidae	*Leporinus nigrotaeniatus*	Novaseq
Actinopteri	Characiformes	Anostomidae	*Leporinus maculatus*	MinION
Actinopteri	Characiformes	Anostomidae	*Leporinus*	Novaseq
Actinopteri	Characiformes	Anostomidae	Anostomidae	Novaseq
Actinopteri	Characiformes	Bryconidae	*Brycon amazonicus*	Novaseq
Actinopteri	Characiformes	Bryconidae	*Brycon falcatus*	Novaseq
Actinopteri	Characiformes	Bryconidae	*Brycon pesu*	Novaseq
Actinopteri	Characiformes	Chalceidae	*Chalceus macrolepidotus*	Novaseq
Actinopteri	Characiformes	Characidae	*Aphyocharax*	MinION
Actinopteri	Characiformes	Characidae	*Astyanax bimaculatus*	Novaseq
Actinopteri	Characiformes	Characidae	*Bryconamericus hyphesson*	Novaseq
Actinopteri	Characiformes	Characidae	*Creagrutus*	MinION
Actinopteri	Characiformes	Characidae	*Hemigrammus cylindricus*	Novaseq
Actinopteri	Characiformes	Characidae	*Hemigrammus ocellifer*	Novaseq
Actinopteri	Characiformes	Characidae	*Jupiaba mucronata*	Novaseq
Actinopteri	Characiformes	Characidae	*Jupiaba pinnata*	Novaseq
Actinopteri	Characiformes	Characidae	*Jupiaba polylepis*	Novaseq
Actinopteri	Characiformes	Characidae	*Knodus heteresthes*	Novaseq
Actinopteri	Characiformes	Characidae	*Megalamphodus rosaceus*	Novaseq
Actinopteri	Characiformes	Characidae	*Moenkhausia browni*	Novaseq
Actinopteri	Characiformes	Characidae	*Moenkhausia dichroura*	Novaseq
Actinopteri	Characiformes	Characidae	*Moenkhausia grandisquamis*	Novaseq
Actinopteri	Characiformes	Characidae	*Moenkhausia oligolepis*	Novaseq

Environmental DNA

LEGEND

Between Camps Amuku and Monkey Jump

Site in rapids sampled during travel between camps

Location undetermined

Taxa detected in our dataset at read densities so low that they cannot be assigned with confidence to a specific sample or site

	Camp Amuku	Camp Monkey Jump	Camp New River	Between Camps Amuku and Monkey Jump	Location undetermined
	x	x	x	x	–
	x	x	–	x	–
	x	x	x	–	–
	x	x	x	x	–
	x	x	–	–	–
	x	x	x	x	–
	x	x	x	x	–
	x	x	x	x	–
	x	x	x	x	–
	x	x	x	x	–
	x	x	x	x	–
	–	–	–	–	x
	x	x	x	x	–
	–	x	–	–	–
	x	–	–	–	–
	x	x	x	x	–
	x	–	–	x	–
	x	–	x	–	–
	–	–	–	–	x
	x	–	x	–	–
	x	x	x	x	–
	x	–	–	–	–
	x	–	–	–	–
	x	x	x	–	–
	x	x	x	–	–
	x	x	x	x	–
	x	x	x	x	–
	–	–	x	–	–
	x	x	x	–	–
	–	–	x	–	–
	x	x	x	–	–
	x	x	x	x	–
	x	x	x	–	–

Appendix 8

Environmental DNA

Class	Order	Family	Taxon	Sequence origin
Actinopteri	Characiformes	Characidae	*Moenkhausia ceros*	MinION
Actinopteri	Characiformes	Characidae	*Moenkhausia*	Novaseq
Actinopteri	Characiformes	Characidae	*Phenacogaster megalostictus*	Novaseq
Actinopteri	Characiformes	Characidae	*Poptella compressa*	Novaseq
Actinopteri	Characiformes	Characidae	*Pristella*	MinION
Actinopteri	Characiformes	Characidae	*Psalidodon fasciatus*	Novaseq
Actinopteri	Characiformes	Characidae	*Tetragonopterus chalceus*	Novaseq
Actinopteri	Characiformes	Characidae	*Tetragonopterus*	Novaseq
Actinopteri	Characiformes	Characidae	Characidae	Novaseq
Actinopteri	Characiformes	Crenuchidae	*Characidium zebra*	Novaseq
Actinopteri	Characiformes	Curimatidae	*Cyphocharax spilurus*	Novaseq
Actinopteri	Characiformes	Curimatidae	*Steindachnerina*	Novaseq
Actinopteri	Characiformes	Erythrinidae	*Erythrinus erythrinus*	Novaseq
Actinopteri	Characiformes	Erythrinidae	*Hoplerythrinus unitaeniatus*	Novaseq
Actinopteri	Characiformes	Erythrinidae	*Hoplias aimara*	Novaseq
Actinopteri	Characiformes	Erythrinidae	*Hoplias malabaricus*	Novaseq
Actinopteri	Characiformes	Erythrinidae	*Hoplias*	Novaseq
Actinopteri	Characiformes	Erythrinidae	Erythrinidae	Novaseq
Actinopteri	Characiformes	Gasteropelecidae	*Carnegiella strigata*	Novaseq
Actinopteri	Characiformes	Hemiodontidae	*Hemiodus microlepis*	Novaseq
Actinopteri	Characiformes	Hemiodontidae	*Hemiodus quadrimaculatus*	Novaseq
Actinopteri	Characiformes	Iguanodectidae	*Bryconops affinis*	Novaseq
Actinopteri	Characiformes	Iguanodectidae	*Bryconops caudomaculatus*	Novaseq
Actinopteri	Characiformes	Lebiasinidae	*Pyrrhulina filamentosa*	Novaseq
Actinopteri	Characiformes	Lebiasinidae	*Pyrrhulina stoli*	Novaseq
Actinopteri	Characiformes	Lebiasinidae	*Pyrrhulina*	Novaseq
Actinopteri	Characiformes	Prochilodontidae	*Prochilodus*	Novaseq
Actinopteri	Characiformes	Serrasalmidae	*Metynnis*	MinION
Actinopteri	Characiformes	Serrasalmidae	*Myleus pacu*	Novaseq
Actinopteri	Characiformes	Serrasalmidae	*Myleus setiger*	Novaseq
Actinopteri	Characiformes	Serrasalmidae	*Myloplus rubripinnis*	Novaseq
Actinopteri	Characiformes	Serrasalmidae	*Myloplus*	Novaseq
Actinopteri	Characiformes	Serrasalmidae	*Pygocentrus nattereri*	Novaseq
Actinopteri	Characiformes	Serrasalmidae	*Serrasalmus rhombeus*	Novaseq
Actinopteri	Characiformes	Serrasalmidae	Serrasalmidae	Novaseq
Actinopteri	Characiformes	NA	Characiformes	Novaseq
Actinopteri	Cichliformes	Cichlidae	*Acarichthys heckelii*	Novaseq
Actinopteri	Cichliformes	Cichlidae	*Apistogramma steindachneri*	Novaseq
Actinopteri	Cichliformes	Cichlidae	*Cichla ocellaris*	Novaseq
Actinopteri	Cichliformes	Cichlidae	*Cichlasoma*	Novaseq
Actinopteri	Cichliformes	Cichlidae	*Crenicichla lepidota*	Novaseq

	Camp Amuku	Camp Monkey Jump	Camp New River	Between Camps Amuku and Monkey Jump	Location undetermined
	–	–	–	–	x
	x	x	x	–	–
	x	x	x	x	–
	x	x	x	x	–
	x	–	–	–	–
	x	x	–	–	–
	x	x	x	x	–
	–	–	–	–	x
	x	x	x	x	–
	x	x	x	–	–
	x	x	x	x	–
	x	–	–	–	–
	x	x	x	–	–
	x	x	x	–	–
	x	x	x	x	–
	x	x	x	–	–
	x	x	x	–	–
	–	–	x	–	–
	–	–	–	–	x
	x	x	x	x	–
	x	x	x	x	–
	x	x	x	x	–
	x	x	x	–	–
	x	x	x	–	–
	–	–	x	–	–
	–	x	–	–	–
	x	x	x	x	–
	–	–	–	–	x
	x	–	–	x	–
	x	x	x	–	–
	x	x	x	–	–
	x	x	x	x	–
	–	–	x	–	–
	x	x	x	x	–
	x	–	x	–	–
	x	x	x	x	–
	x	x	–	–	–
	x	x	x	x	–
	x	x	x	x	–
	x	x	x	–	–
	x	x	x	x	–

LEGEND

Between Camps Amuku and Monkey Jump

Site in rapids sampled during travel between camps

Location undetermined

Taxa detected in our dataset at read densities so low that they cannot be assigned with confidence to a specific sample or site

Appendix 8

Environmental DNA

Class	Order	Family	Taxon	Sequence origin
Actinopteri	Cichliformes	Cichlidae	*Guianacara dacrya*	Novaseq
Actinopteri	Cichliformes	Cichlidae	*Krobia guianensis*	Novaseq
Actinopteri	Cichliformes	Cichlidae	*Pterophyllum*	MinION
Actinopteri	Cichliformes	Cichlidae	Cichlidae	Novaseq
Actinopteri	Cyprinodontiformes	Rivulidae	*Cynodonichthys*	MinION
Actinopteri	Cyprinodontiformes	Rivulidae	*Laimosemion agilae*	Novaseq
Actinopteri	Gymnotiformes	Apteronotidae	*Apteronotus albifrons*	Novaseq
Actinopteri	Gymnotiformes	Gymnotidae	*Electrophorus electricus*	Novaseq
Actinopteri	Gymnotiformes	Gymnotidae	*Gymnotus carapo*	Novaseq
Actinopteri	Gymnotiformes	Hypopomidae	*Brachyhypopomus walteri*	Novaseq
Actinopteri	Gymnotiformes	Hypopomidae	*Brachyhypopomus*	Novaseq
Actinopteri	Gymnotiformes	Rhamphichthyidae	*Gymnorhamphichthys rondoni*	Novaseq
Actinopteri	Gymnotiformes	Sternopygidae	*Eigenmannia limbata*	Novaseq
Actinopteri	Gymnotiformes	Sternopygidae	*Rhabdolichops eastwardi*	Novaseq
Actinopteri	Gymnotiformes	Sternopygidae	*Sternopygus macrurus*	Novaseq
Actinopteri	Gymnotiformes	Sternopygidae	Sternopygidae	Novaseq
Actinopteri	Gymnotiformes	NA	Gymnotiformes	Novaseq
Actinopteri	Perciformes	NA	Perciformes	Novaseq
Actinopteri	Siluriformes	Auchenipteridae	*Ageneiosus inermis*	Novaseq
Actinopteri	Siluriformes	Auchenipteridae	*Ageneiosus ucayalensis*	Novaseq
Actinopteri	Siluriformes	Auchenipteridae	*Auchenipterichthys*	MinION
Actinopteri	Siluriformes	Auchenipteridae	*Auchenipterus demerarae*	Novaseq
Actinopteri	Siluriformes	Auchenipteridae	*Tatia intermedia*	Novaseq
Actinopteri	Siluriformes	Auchenipteridae	*Trachelyopterus galeatus*	Novaseq
Actinopteri	Siluriformes	Auchenipteridae	Auchenipteridae	Novaseq
Actinopteri	Siluriformes	Callichthyidae	*Callichthys callichthys*	Novaseq
Actinopteri	Siluriformes	Callichthyidae	*Megalechis thoracata*	Novaseq
Actinopteri	Siluriformes	Callichthyidae	*Osteogaster aeneus*	Novaseq
Actinopteri	Siluriformes	Cetopsidae	*Cetopsidium*	Novaseq
Actinopteri	Siluriformes	Cetopsidae	*Helogenes marmoratus*	Novaseq
Actinopteri	Siluriformes	Doradidae	*Acanthodoras spinosissimus*	Novaseq
Actinopteri	Siluriformes	Doradidae	*Doras carinatus*	Novaseq
Actinopteri	Siluriformes	Doradidae	*Doras micropoeus*	Novaseq
Actinopteri	Siluriformes	Doradidae	*Platydoras costatus*	Novaseq
Actinopteri	Siluriformes	Doradidae	Doradidae	Novaseq
Actinopteri	Siluriformes	Heptapteridae	*Goeldiella*	MinION
Actinopteri	Siluriformes	Heptapteridae	*Imparfinis hasemani*	Novaseq
Actinopteri	Siluriformes	Heptapteridae	*Pimelodella cristata*	Novaseq
Actinopteri	Siluriformes	Heptapteridae	Heptapteridae	Novaseq
Actinopteri	Siluriformes	Loricariidae	*Aphanotorulus emarginatus*	MinION
Actinopteri	Siluriformes	Loricariidae	*Aphanotorulus*	MinION

	Camp Amuku	Camp Monkey Jump	Camp New River	Between Camps Amuku and Monkey Jump	Location undetermined
	x	x	x	x	–
	–	–	x	–	–
	–	–	–	–	x
	x	x	x	–	–
	–	–	–	–	x
	–	x	–	–	–
	x	x	x	x	–
	x	x	x	–	–
	x	x	x	–	–
	x	x	x	x	–
	x	x	x	–	–
	x	x	x	–	–
	x	x	x	x	–
	–	–	x	–	–
	x	x	x	x	–
	–	x	x	–	–
	x	x	x	x	–
	–	–	–	–	x
	–	–	x	–	–
	x	–	x	x	–
	–	–	–	–	x
	x	x	x	–	–
	x	x	–	–	–
	x	x	–	–	–
	x	x	–	–	–
	x	x	x	–	–
	x	x	x	–	–
	x	x	x	–	–
	x	x	x	x	–
	–	x	–	–	–
	x	–	–	–	–
	x	x	x	x	–
	–	–	x	–	–
	x	x	–	x	–
	–	x	x	–	–
	x	x	–	–	–
	x	–	x	–	–
	x	x	x	x	–
	x	x	–	–	–
	–	–	–	–	x
	–	–	–	–	x

LEGEND

Between Camps Amuku and Monkey Jump

Site in rapids sampled during travel between camps

Location undetermined

Taxa detected in our dataset at read densities so low that they cannot be assigned with confidence to a specific sample or site

Appendix 8

Environmental DNA

Class	Order	Family	Taxon	Sequence origin
Actinopteri	Siluriformes	Loricariidae	*Cteniloricaria platystoma*	Novaseq
Actinopteri	Siluriformes	Loricariidae	*Farlowella*	MinION
Actinopteri	Siluriformes	Loricariidae	*Guyanancistrus brevispinis*	Novaseq
Actinopteri	Siluriformes	Loricariidae	*Hypoptopoma*	MinION
Actinopteri	Siluriformes	Loricariidae	*Hypostomus plecostomus*	Novaseq
Actinopteri	Siluriformes	Loricariidae	*Lasiancistrus schomburgkii*	Novaseq
Actinopteri	Siluriformes	Loricariidae	*Loricaria*	MinION
Actinopteri	Siluriformes	Loricariidae	*Peckoltia cavatica*	Novaseq
Actinopteri	Siluriformes	Loricariidae	*Peckoltia sabaji*	Novaseq
Actinopteri	Siluriformes	Loricariidae	*Peckoltia*	Novaseq
Actinopteri	Siluriformes	Loricariidae	*Pseudancistrus barbatus*	Novaseq
Actinopteri	Siluriformes	Loricariidae	*Pseudancistrus nigrescens*	Novaseq
Actinopteri	Siluriformes	Loricariidae	*Pseudoloricaria laeviuscula*	Novaseq
Actinopteri	Siluriformes	Loricariidae	*Rineloricaria platyura*	Novaseq
Actinopteri	Siluriformes	Loricariidae	*Rineloricaria stewarti*	Novaseq
Actinopteri	Siluriformes	Loricariidae	*Rineloricaria*	Novaseq
Actinopteri	Siluriformes	Loricariidae	Loricariidae	Novaseq
Actinopteri	Siluriformes	Pimelodidae	*Brachyplatystoma vaillantii*	MinION
Actinopteri	Siluriformes	Pimelodidae	*Brachyplatystoma*	Novaseq
Actinopteri	Siluriformes	Pimelodidae	*Calophysus macropterus*	Novaseq
Actinopteri	Siluriformes	Pimelodidae	*Hemisorubim platyrhynchos*	Novaseq
Actinopteri	Siluriformes	Pimelodidae	*Leiarius pictus*	Novaseq
Actinopteri	Siluriformes	Pimelodidae	*Megalonema*	MinION
Actinopteri	Siluriformes	Pimelodidae	*Phractocephalus hemioliopterus*	Novaseq
Actinopteri	Siluriformes	Pimelodidae	*Pimelodus albofasciatus*	Novaseq
Actinopteri	Siluriformes	Pimelodidae	*Pimelodus blochii*	Novaseq
Actinopteri	Siluriformes	Pimelodidae	*Pimelodus ornatus*	Novaseq
Actinopteri	Siluriformes	Pimelodidae	*Pimelodus*	Novaseq
Actinopteri	Siluriformes	Pimelodidae	*Pinirampus pirinampu*	Novaseq
Actinopteri	Siluriformes	Pimelodidae	*Pseudoplatystoma tigrinum*	Novaseq
Actinopteri	Siluriformes	Pimelodidae	*Sorubim*	Novaseq
Actinopteri	Siluriformes	Pimelodidae	*Zungaro zungaro*	Novaseq
Actinopteri	Siluriformes	Pimelodidae	Pimelodidae	Novaseq
Actinopteri	Siluriformes	Pseudopimelodidae	*Pseudopimelodus bufonius*	Novaseq
Actinopteri	Siluriformes	Trichomycteridae	*Trichomycterus*	Novaseq
Actinopteri	Siluriformes	Trichomycteridae	Trichomycteridae	Novaseq
Actinopteri	Siluriformes	NA	Siluriformes	Novaseq
Actinopteri	Synbranchiformes	Synbranchidae	*Synbranchus marmoratus*	Novaseq
Actinopteri	NA	NA	Actinopteri	Novaseq
Chondrichthyes	Myliobatiformes	Potamotrygonidae	*Potamotrygon*	Novaseq
Amphibia	Anura	Allophrynidae	*Allophryne ruthveni*	Novaseq

	Camp Amuku	Camp Monkey Jump	Camp New River	Between Camps Amuku and Monkey Jump	Location undetermined
	x	x	x	x	–
	–	–	–	–	x
	x	x	x	–	–
	–	–	–	–	x
	x	x	x	x	–
	x	–	–	–	–
	–	–	–	–	x
	–	–	x	–	–
	–	–	x	–	–
	–	–	x	–	–
	–	–	x	–	–
	x	x	x	x	–
	x	x	–	x	–
	–	x	–	–	–
	x	x	–	–	–
	–	x	–	–	–
	x	x	x	–	–
	–	–	–	–	x
	–	x	x	–	–
	–	x	–	–	–
	x	x	x	x	–
	–	x	–	–	–
	–	–	–	–	x
	–	–	x	–	–
	x	x	–	–	–
	–	x	x	–	–
	x	x	x	–	–
	–	–	–	–	x
	x	x	–	x	–
	x	x	x	x	–
	–	–	x	–	–
	x	–	–	–	–
	x	x	x	x	–
	x	–	x	x	–
	–	x	–	–	–
	x	x	–	–	–
	x	x	x	x	–
	x	x	x	–	–
	x	x	x	x	–
	–	x	x	–	–
	x	–	–	–	–

LEGEND

Between Camps Amuku and Monkey Jump

Site in rapids sampled during travel between camps

Location undetermined

Taxa detected in our dataset at read densities so low that they cannot be assigned with confidence to a specific sample or site

Appendix 8

Environmental DNA

Class	Order	Family	Taxon	Sequence origin
Amphibia	Anura	Bufonidae	*Rhaebo guttatus*	Novaseq
Amphibia	Anura	Bufonidae	*Rhinella lescurei*	Novaseq
Amphibia	Anura	Bufonidae	*Rhinella marina*	Novaseq
Amphibia	Anura	Bufonidae	*Rhinella martyi*	Novaseq
Amphibia	Anura	Bufonidae	*Rhinella gr. margaritifera*	MinION
Amphibia	Anura	Centrolenidae	*Hyalinobatrachium iaspidiense*	Novaseq
Amphibia	Anura	Centrolenidae	*Hyalinobatrachium*	Novaseq
Amphibia	Anura	Hylidae	*Boana xerophylla*	Novaseq
Amphibia	Anura	Hylidae	*Osteocephalus*	Novaseq
Amphibia	Anura	Hylidae	*Scinax cruentomma*	Novaseq
Amphibia	Anura	Hylidae	*Scinax gr. cruentomma*	MinION
Amphibia	Anura	Hylidae	*Trachycephalus resinifictrix*	Novaseq
Amphibia	Anura	Leptodactylidae	*Leptodactylus guianensis*	Novaseq
Amphibia	Anura	Leptodactylidae	*Leptodactylus macrosternum*	Novaseq
Amphibia	Anura	Leptodactylidae	*Leptodactylus pentadactylus*	Novaseq
Amphibia	Anura	Leptodactylidae	*Leptodactylus petersii*	Novaseq
Amphibia	Anura	Leptodactylidae	*Leptodactylus gr. podicipinus*	MinION
Amphibia	Anura	Microhylidae	*Chiasmocleis shudikarensis*	Novaseq
Amphibia	Anura	Pipidae	*Pipa aspera*	Novaseq
Amphibia	Anura	Pipidae	*Pipa pipa*	Novaseq
Amphibia	Gymnophiona	Caeciliidae	*Caecilia gracilis*	Novaseq
Reptilia	Crocodylia	Alligatoridae	*Paleosuchus trigonatus*	Novaseq
Reptilia	Squamata	Boidae	*Corallus hortulana*	Novaseq
Reptilia	Squamata	Gymnophthalmidae	*Arthrosaura reticulata*	Novaseq
Reptilia	Squamata	Gymnophthalmidae	*Loxopholis percarinatum*	Novaseq
Reptilia	Testudines	Chelidae	*Chelus fimbriata*	Novaseq
Reptilia	Testudines	Geoemydidae	*Rhinoclemmys punctularia*	Novaseq
Reptilia	Testudines	Podocnemididae	*Podocnemis expansa*	Novaseq
Reptilia	Testudines	Testudinidae	*Chelonoidis denticulatus*	Novaseq
Aves	Accipitriformes	Accipitridae	*Buteogallus urubitinga*	Novaseq
Aves	Accipitriformes	Accipitridae	*Pseudastur albicollis*	MinION
Aves	Anseriformes	Anatidae	*Cairina moschata*	Novaseq
Aves	Apodiformes	Trochilidae	Trochilidae	Novaseq
Aves	Columbiformes	Columbidae	*Leptotila rufaxilla*	Novaseq
Aves	Columbiformes	Columbidae	*Patagioenas*	Novaseq
Aves	Coraciiformes	Alcedinidae	*Chloroceryle aenea*	Novaseq
Aves	Coraciiformes	Alcedinidae	*Chloroceryle inda*	Novaseq
Aves	Galliformes	Cracidae	*Ortalis*	Novaseq
Aves	Galliformes	Cracidae	*Pipile cumanensis*	Novaseq
Aves	Gruiformes	Psophiidae	*Psophia crepitans*	Novaseq
Aves	Passeriformes	Cotingidae	Cotingidae	Novaseq

	Camp Amuku	Camp Monkey Jump	Camp New River	Between Camps Amuku and Monkey Jump	Location undetermined
	–	–	x	–	–
	x	x	x	–	–
	x	x	x	–	–
	x	x	x	x	–
	x	x	x	–	–
	–	x	–	–	–
	–	x	x	–	–
	–	x	–	–	–
	–	x	x	–	–
	–	–	–	–	x
	–	–	–	–	x
	–	x	–	–	–
	x	–	–	–	–
	–	–	–	–	x
	–	–	–	–	x
	x	x	–	–	–
	–	–	x	–	–
	–	–	x	–	–
	–	–	x	–	–
	–	–	x	–	–
	–	–	–	–	x
	–	x	x	–	–
	–	–	x	–	–
	–	x	–	–	–
	–	–	–	–	x
	–	x	–	–	–
	–	x	–	–	–
	–	x	–	–	–
	–	–	x	–	–
	–	–	–	–	x
	–	–	–	–	x
	–	–	–	–	x
	–	–	x	–	–
	–	–	x	–	–
	–	–	x	–	–
	–	–	–	–	x
	–	–	–	–	x
	x	–	–	–	–
	x	x	x	–	–
	–	–	x	–	–
	–	–	–	–	x

LEGEND

Between Camps Amuku and Monkey Jump

Site in rapids sampled during travel between camps

Location undetermined

Taxa detected in our dataset at read densities so low that they cannot be assigned with confidence to a specific sample or site

Appendix 8

Environmental DNA

Class	Order	Family	Taxon	Sequence origin
Aves	Passeriformes	Furnariidae	*Deconychura longicauda*	Novaseq
Aves	Passeriformes	Fringillidae	*Euphonia cayennensis*	Novaseq
Aves	Passeriformes	Fringillidae	Fringillidae	Novaseq
Aves	Passeriformes	Furnariidae	*Glyphorynchus spirurus*	Novaseq
Aves	Passeriformes	Furnariidae	*Xiphorhynchus pardalotus*	Novaseq
Aves	Passeriformes	Thamnophilidae	*Epinecrophylla gutturalis*	Novaseq
Aves	Passeriformes	Thamnophilidae	*Gymnopithys rufigula*	Novaseq
Aves	Passeriformes	Thamnophilidae	*Hylophylax naevius*	MinION
Aves	Passeriformes	Thamnophilidae	*Myrmotherula axillaris*	Novaseq
Aves	Passeriformes	Thamnophilidae	*Percnostola leucostigma*	Novaseq
Aves	Passeriformes	Thamnophilidae	*Percnostola*	MinION
Aves	Passeriformes	Thamnophilidae	*Thamnomanes*	Novaseq
Aves	Passeriformes	Thamnophilidae	*Thamnophilus*	MinION
Aves	Passeriformes	Thamnophilidae	Thamnophilidae	Novaseq
Aves	Passeriformes	Thraupidae	*Coereba flaveola*	Novaseq
Aves	Passeriformes	Thraupidae	*Dacnis cayana*	Novaseq
Aves	Passeriformes	Thraupidae	Thraupidae	Novaseq
Aves	Passeriformes	Tyrannidae	Tyrannidae	Novaseq
Aves	Passeriformes	NA	Passeriformes	Novaseq
Aves	Pelecaniformes	Ardeidae	*Butorides striata*	Novaseq
Aves	Pelecaniformes	Ardeidae	*Cochlearius cochlearius*	Novaseq
Aves	Pelecaniformes	Ardeidae	*Tigrisoma lineatum*	Novaseq
Aves	Pelecaniformes	Threskiornithidae	*Mesembrinibis cayennensis*	Novaseq
Aves	Piciformes	Bucconidae	*Malacoptila fusca*	Novaseq
Aves	Piciformes	Bucconidae	Bucconidae	Novaseq
Aves	Piciformes	Picidae	*Celeus flavus*	Novaseq
Aves	Piciformes	Picidae	Picidae	Novaseq
Aves	Piciformes	Ramphastidae	*Ramphastos tucanus*	Novaseq
Aves	Piciformes	Ramphastidae	*Ramphastos vitellinus*	Novaseq
Aves	Piciformes	Ramphastidae	*Ramphastos*	Novaseq
Aves	Piciformes	NA	Piciformes	Novaseq
Aves	Psittaciformes	Psittacidae	*Amazona*	Novaseq
Aves	Psittaciformes	Psittacidae	*Ara ararauna*	Novaseq
Aves	Psittaciformes	Psittacidae	*Ara macao*	Novaseq
Aves	Psittaciformes	Psittacidae	*Ara*	Novaseq
Aves	Suliformes	Anhingidae	*Anhinga anhinga*	Novaseq
Aves	Tinamiformes	Tinamidae	*Crypturellus soui*	Novaseq
Aves	Tinamiformes	Tinamidae	*Tinamus major*	Novaseq
Aves	NA	NA	Aves	Novaseq
Mammalia	Artiodactyla	Cervidae	*Mazama americana*	Novaseq
Mammalia	Artiodactyla	Cervidae	Cervidae	Novaseq

Environmental DNA

	Camp Amuku	Camp Monkey Jump	Camp New River	Between Camps Amuku and Monkey Jump	Location undetermined
	–	–	–	–	x
	–	–	–	–	x
	–	–	x	–	–
	–	–	x	–	–
	x	–	–	–	–
	–	–	x	–	–
	x	–	–	–	–
	–	–	–	–	x
	x	–	–	–	–
	–	x	x	–	–
	–	–	–	–	x
	x	–	–	–	–
	–	–	–	–	x
	x	–	–	–	–
	–	x	–	–	–
	–	x	–	–	–
	–	x	–	–	–
	x	–	–	–	–
	–	x	x	–	–
	–	–	x	–	–
	x	–	–	–	–
	–	x	–	–	–
	–	–	x	–	–
	x	–	–	–	–
	–	–	x	–	–
	–	–	x	–	–
	x	–	–	–	–
	–	x	–	–	–
	–	–	x	–	–
	–	–	–	–	x
	x	–	–	–	–
	–	–	x	–	–
	–	x	x	–	–
	–	x	–	–	–
	–	–	–	–	x
	–	–	–	–	x
	–	–	–	–	x
	–	–	–	–	x
	–	x	–	–	–
	–	–	–	–	x
	–	–	x	–	–

LEGEND

Between Camps Amuku and Monkey Jump

Site in rapids sampled during travel between camps

Location undetermined

Taxa detected in our dataset at read densities so low that they cannot be assigned with confidence to a specific sample or site

Appendix 8

Environmental DNA

Class	Order	Family	Taxon	Sequence origin
Mammalia	Artiodactyla	Tayassuidae	*Dicotyles tajacu*	Novaseq
Mammalia	Artiodactyla	Tayassuidae	*Tayassu pecari*	Novaseq
Mammalia	Carnivora	Felidae	*Leopardus pardalis*	Novaseq
Mammalia	Carnivora	Felidae	*Leopardus*	Novaseq
Mammalia	Carnivora	Felidae	*Puma concolor*	Novaseq
Mammalia	Carnivora	Mustelidae	*Lontra longicaudis*	Novaseq
Mammalia	Carnivora	Mustelidae	*Pteronura brasiliensis*	Novaseq
Mammalia	Carnivora	Mustelidae	Mustelidae	Novaseq
Mammalia	Carnivora	Procyonidae	*Nasua nasua*	Novaseq
Mammalia	Carnivora	Procyonidae	*Potos flavus*	Novaseq
Mammalia	Chiroptera	Emballonuridae	*Cormura brevirostris*	Novaseq
Mammalia	Chiroptera	Emballonuridae	*Diclidurus scutatus*	Novaseq
Mammalia	Chiroptera	Emballonuridae	*Peropteryx macrotis*	Novaseq
Mammalia	Chiroptera	Emballonuridae	*Rhynchonycteris naso*	Novaseq
Mammalia	Chiroptera	Noctilionidae	*Noctilio leporinus*	Novaseq
Mammalia	Chiroptera	Phyllostomidae	*Artibeus glaucus*	Novaseq
Mammalia	Chiroptera	Phyllostomidae	*Artibeus planirostris*	Novaseq
Mammalia	Chiroptera	Phyllostomidae	*Artibeus*	Novaseq
Mammalia	Chiroptera	Phyllostomidae	*Carollia perspicillata*	Novaseq
Mammalia	Chiroptera	Phyllostomidae	*Macrophyllum macrophyllum*	Novaseq
Mammalia	Chiroptera	Phyllostomidae	*Phyllostomus*	Novaseq
Mammalia	Chiroptera	Phyllostomidae	*Platyrrhinus*	Novaseq
Mammalia	Chiroptera	Phyllostomidae	*Trachops cirrhosus*	Novaseq
Mammalia	Chiroptera	Phyllostomidae	*Uroderma bilobatum*	Novaseq
Mammalia	Chiroptera	Phyllostomidae	Phyllostomidae	Novaseq
Mammalia	Chiroptera	Vespertilionidae	*Myotis riparius*	Novaseq
Mammalia	Chiroptera	NA	Chiroptera	Novaseq
Mammalia	Cingulata	Chlamyphoridae	*Priodontes maximus*	Novaseq
Mammalia	Cingulata	Dasypodidae	*Dasypus kappleri*	Novaseq
Mammalia	Cingulata	Dasypodidae	*Dasypus novemcinctus*	Novaseq
Mammalia	Didelphimorphia	Didelphidae	*Caluromys philander*	Novaseq
Mammalia	Didelphimorphia	Didelphidae	*Gracilinanus emiliae*	Novaseq
Mammalia	Didelphimorphia	Didelphidae	*Marmosa demerarae*	Novaseq
Mammalia	Didelphimorphia	Didelphidae	*Metachirus nudicaudatus*	Novaseq
Mammalia	Didelphimorphia	Didelphidae	*Monodelphis brevicaudata*	Novaseq
Mammalia	Didelphimorphia	Didelphidae	*Philander opossum*	Novaseq
Mammalia	Didelphimorphia	Didelphidae	Didelphidae	Novaseq
Mammalia	Perissodactyla	Tapiridae	*Tapirus terrestris*	Novaseq
Mammalia	Pilosa	Bradypodidae	*Bradypus tridactylus*	Novaseq
Mammalia	Pilosa	Myrmecophagidae	*Myrmecophaga tridactyla*	Novaseq
Mammalia	Pilosa	Myrmecophagidae	*Tamandua tetradactyla*	Novaseq

	Camp Amuku	Camp Monkey Jump	Camp New River	Between Camps Amuku and Monkey Jump	Location undetermined
	x	x	x	–	–
	x	x	x	–	–
	–	x	–	–	–
	x	–	–	–	–
	–	x	–	–	–
	–	x	–	–	–
	x	x	–	–	–
	–	x	–	–	–
	–	–	–	–	x
	–	–	x	–	–
	–	x	–	–	–
	–	–	–	–	x
	–	x	–	–	–
	x	–	x	–	–
	–	–	–	–	x
	x	–	–	–	–
	x	–	–	–	–
	–	–	x	–	–
	–	x	–	–	–
	–	–	–	–	x
	–	–	–	–	x
	–	–	x	–	–
	x	–	–	–	–
	–	x	–	–	–
	x	x	–	–	–
	x	–	–	–	–
	x	x	x	–	–
	x	x	–	–	–
	–	–	–	–	x
	x	–	–	–	–
	–	–	–	–	x
	–	–	x	–	–
	–	x	–	–	–
	x	–	–	–	–
	–	x	–	–	–
	–	x	–	–	–
	–	–	x	–	–
	x	x	x	x	–
	–	x	–	–	–
	x	x	x	–	–
	–	x	x	–	–

LEGEND

Between Camps Amuku and Monkey Jump

Site in rapids sampled during travel between camps

Location undetermined

Taxa detected in our dataset at read densities so low that they cannot be assigned with confidence to a specific sample or site

Appendix 8

Environmental DNA

Class	Order	Family	Taxon	Sequence origin
Mammalia	Primates	Atelidae	*Alouatta macconnelli*	Novaseq
Mammalia	Primates	Atelidae	*Ateles paniscus*	Novaseq
Mammalia	Primates	Atelidae	Atelidae	Novaseq
Mammalia	Primates	Cebidae	*Cebus olivaceus*	Novaseq
Mammalia	Primates	Cebidae	*Saguinus midas*	Novaseq
Mammalia	Primates	Cebidae	*Saimiri sciureus*	Novaseq
Mammalia	Primates	Cebidae	*Sapajus apella*	Novaseq
Mammalia	Primates	Pitheciidae	*Chiropotes satanas*	Novaseq
Mammalia	Primates	Pitheciidae	*Pithecia pithecia*	Novaseq
Mammalia	Primates	NA	Primates	Novaseq
Mammalia	Rodentia	Cricetidae	*Hylaeamys megacephalus*	Novaseq
Mammalia	Rodentia	Cricetidae	*Hylaeamys yunganus*	Novaseq
Mammalia	Rodentia	Cricetidae	*Nectomys rattus*	Novaseq
Mammalia	Rodentia	Cricetidae	*Oecomys bicolor*	Novaseq
Mammalia	Rodentia	Cricetidae	*Oecomys concolor*	Novaseq
Mammalia	Rodentia	Cricetidae	*Oecomys rutilus*	Novaseq
Mammalia	Rodentia	Cuniculidae	*Cuniculus paca*	Novaseq
Mammalia	Rodentia	Dasyproctidae	*Dasyprocta leporina*	Novaseq
Mammalia	Rodentia	Dasyproctidae	*Myoprocta acouchy*	Novaseq
Mammalia	Rodentia	Echimyidae	*Makalata didelphoides*	Novaseq
Mammalia	Rodentia	Echimyidae	*Mesomys hispidus*	Novaseq
Mammalia	Rodentia	Echimyidae	Echimyidae	Novaseq
Mammalia	Rodentia	Erethizontidae	*Coendou*	Novaseq
Mammalia	Rodentia	Hydrochaeridae	*Hydrochoerus hydrochaeris*	Novaseq
Mammalia	Rodentia	Sciuridae	*Sciurus gilvigularis*	Novaseq
Mammalia	Rodentia	NA	Rodentia	Novaseq
Mammalia	NA	NA	Mammalia	Novaseq

	Camp Amuku	Camp Monkey Jump	Camp New River	Between Camps Amuku and Monkey Jump	Location undetermined
	–	x	x	–	–
	–	–	x	–	–
	–	x	–	–	–
	–	–	–	–	x
	–	–	–	–	x
	x	–	–	–	–
	x	x	x	–	–
	–	x	–	–	–
	x	–	–	–	–
	–	–	x	–	–
	–	x	–	–	–
	–	–	–	–	x
	–	x	–	–	–
	–	x	–	–	–
	x	–	x	–	–
	–	–	x	–	–
	x	x	–	–	–
	–	–	–	–	x
	x	x	–	–	–
	x	x	x	–	–
	–	–	x	–	–
	–	x	–	–	–
	x	–	–	–	–
	x	–	–	–	–
	–	–	–	–	x
	x	–	–	–	–
	x	x	–	–	–

LEGEND

Between Camps Amuku and Monkey Jump

Site in rapids sampled during travel between camps

Location undetermined

Taxa detected in our dataset at read densities so low that they cannot be assigned with confidence to a specific sample or site

Local ecological knowledge: Indigenous names for selected flora and fauna

As part of the local ecological knowledge research, the rapid inventory team compiled Indigenous names for selected plants and animals in Waiwai, Wapishana, and Trio languages. The list provided here is based partly on species observed during the biological fieldwork but also includes other plants and animals that local experts perceived as common in the region or wanted to include. It is not an exhaustive list. In Georgetown, during the write-up phase following the fieldwork, Reuben Yamochi and Kwang Suse added further Waiwai names; Onesimus Rudolph and Asaph Wilson added Wapishana names; and Asiriyan Kenke added Trio names. Spellings follow the conventions preferred by these experts.

Taxanomic group	Species name	English	Waiwai	Wapishana	Trio
Plants	*Euterpe oleracea*	Açaí	Manaka	Waap	Wapú
Plants	*Bertholletia excelsa*	Brazil nut tree	Titkô	Miñui	Tuhá
Plants	*Manilkara bidentata*	Balata	Xawu	Iziiyara	Balata
Plants	*Virola surinamensis*	Dolly tree		Kire	
Plants	*Deguelia* cf. *chrysophylla*	Haiyari	Umawa	Aishara	Ineku
Plants	*Mauritia flexuosa*	Ité	Yoowu	Di'u	Koi
Plants	*Attalea maripa*	Kokerite	Maripa	Pokoridi	Maripa
Plants	*Dinizia excelsa*	Red angelim	Kukwa	Wakowad	Ëtëkëre
Plants		Spiny palm	Karanaru	Borokosh	
Fishes	*Hypostomus* and *Ancistrus* spp.	Armored catfish	Poré	Sowirik	Përe
Fishes	*Prochilodus rubrotaiereatus*	Bocachico	Posu	Zooro	Kuruímë
Fishes	*Leiarius marmoratus*	Catfish, Jaguar catfish	Kanamuruku	Kinidar	Kunoraïma
Fishes	*Plagioscion squamosissimus*, *Petilipinnis grunniens*	Drumfish	Rusu	Basha	Kupi
Fishes	*Electrophorus electricus*	Electric eel	Kaxmi	Kasomi	Arimina
Fishes	*Hoplias aimara*	Haimara, Wolf fish	Aimara	Achmairi	Aimara
Fishes	*Callichthys callichthys*	Hassar	Otpa	Ma'daari	Siwiri
Fishes	*Zungaro zungaro*	Jau catfish	Kanamuruku	Pachichi	
Fishes	*Cichla* cf. *ocellaris*, *C.* cf. *temensis*	Peacock bass	Parana	Parizab	Matawarima
Fishes	*Serrasalmus rhombeus*	Piranha	Poni	Pirinha	Pëne
Fishes	*Myleus setiger* and others	Red pacu	Marawica, Kuruwarî, Pakuci	Auzap	Wasitau
Fishes	*Potamotrygon* spp.	Stingray	Xpari	Duburi	Sipári
Fishes	*Pseudoplatystoma fasciatum*	Tigerfish	Okoropicho	Korĭz	Suruí
Fishes	*Hydrolycus armatus*	Vampire fish	Reyu	Daubara	Rei
Fishes	*Brycon falcatus* or *B. pesu*		Puxa	Kuti	Morukaïma
Fishes	*Saxatilia alta*		Xurwata	Sorosab	Timanaiyoki
Amphibians	*Dendrobates tinctorius*	Blue poison frog	Kipikipi		Okopipi
Amphibians	Anura spp.	Frog	Pororî	Kibairo	Përëru
Amphibians		Mountain chicken (frog)	Maawa		Mawa
Amphibians		Riverside frog	Kuto		Kokokane
Amphibians	*Urodela* spp.	Salamander	Atkara	Atokari	Rupei
Amphibians		Type of lizard	Xukurwa	Kowit	Yoi
Amphibians		Water lizard	Wakanama	Tomtom	
Reptiles	*Eunectes murinus*	Anaconda	Okoimo	Pakubai	Matapi

Taxanomic group	Species name	English	Waiwai	Wapishana	Trio
Reptiles	*Boa constrictor*	Boa constrictor	Potwoimo	Kadadzapan	Aramari
Reptiles	Elapidae spp.	Coral snake	Kîrîrî	Karanari	Tïïmenuren, Ëkëi
Reptiles	*Corallus caninus*	Emerald tree boa	Arô	Waroi	Aro
Reptiles	*Iguana iguana*	Iguana	Kwana	Sowan	Iwana
Reptiles	*Chelonoidis denticulata*	Yellow-footed tortoise	Wayamo	Worád	Kurija, Oikurija
Reptiles		Water turtle	Kwaci	Daza'o	Pejo
Birds	*Ara ararauna*	Blue-and-yellow Macaw	Xaapi	Kazara	Ararauwá
Birds	*Pipile cumanensis*	Blue-throated Piping-Guan	Kuyuwi	Kochoi	Kuwi
Birds	*Daptrius ater*	Black Caracara	Maxpereñe	Chiiz	
Birds	*Crax alector*	Black Curassow	Pawxi	Pawish	Ôkó
Birds	*Coragyps atratus*	Black Vulture	Kwacinama	Wato	Paiekï
Birds	Falconidae spp.	Falcon	Páwa	Karap, Izzu	
Birds	*Psophia crepitans*	Gray-winged Trumpeter	Pixko	Namach	Mami
Birds	*Rupicola rupicola*	Guianan Cock-of-the-rock	Peewu	Kowanar	Meu
Birds	*Harpia harpyja*	Harpy Eagle	Yaimo	Kokoi	Piana
Birds	Accipitridae spp.	Hawk	Wikoko	Wiruum, Kwa'dir	Piyana, Pisi
Birds	*Sarcoramphus papa*	King Vulture	Kuruum	Banaunoro	Sani
Birds	*Penelope marail*	Marail Guan	Marati	Maratoro	Marasi
Birds	*Cairina moschata*	Muscovy Duck	Yoruma	Bai	Ulumaimë
Birds	Psittacidae spp.	Parrot	Waro	Waro	Parawa
Birds	Tinamidae	Tinamou	Potwo	Mam	Pëtunë
Birds	Ramphastidae	Toucan	Yakwe	Chakoi	Kiyapoko
Birds	*Cathartes aura*	Turkey Vulture	Kwacinama	Anawan	Watëikë
Birds	*Ara chloropterus*	Red-and-green Macaw	Kwayari	Koyara	Kuyari
Birds	*Orthopsittaca manilatus*	Red-bellied Macaw	Kawayapa	Katoriz	Sakai
Birds	*Ara macao*	Scarlet Macaw	Kworo	Shako	Kinororën
Birds	*Penelope jacquacu*	Spix's Guan (Marovy bird)	Marathî	Marat	Marasi
Mammals	*Dasypus* or *Cabassous* spp.	Armadillo (others)	Kapayo	Kapashi	Kapai
Mammals	Chiroptera spp.	Bat	Rere	Tamario	Nére
Mammals	*Chiropotes sagulatus*	Bearded saki	Uuxa	Wishi	Ixuïmë
Mammals	*Ateles paniscus*	Black spider monkey	Poroto	R'oomi	Arimi
Mammals	*Sapajus apella*	Brown capuchin monkey	Meeku	Puwat	Taripi
Mammals	*Dicotyles tajacu*	Collared peccary	Pakra	Bakuru	Pakira
Mammals	*Myrmecophaga tridactyla*	Giant anteater	Amaci	Tamanuwa	Masiwë
Mammals	*Priodontes maximus*	Giant armadillo	Marura	Maroro	Moraima
Mammals	*Pteronura brasiliensis*	Giant otter	Wayawaya	Saaru	Yawi
Mammals	*Alouatta macconnelli*	Howler monkey	Xîpîrî	Suburu	Arawata
Mammals	*Panthera onca*	Jaguar	Kamara	Buidukoro	Kaikwee
Mammals	*Leopardus pardalis*	Ocelot	Maracaxa	Wadaran	Tokorori
Mammals	*Cuniculus paca*	Paca (labba)	Wiira	Oran	Kurimão
Mammals	*Puma concolor*	Puma	Kosowarai	Koshardin	Alawatara

Appendix 9

Local ecological knowledge

Taxanomic group	Species name	English	Waiwai	Wapishana	Trio
Mammals	*Tapirus terrestris*	Tapir	Yaipî	Kodoi	Pai
Mammals	*Mazama americana*	Red brocket deer	Kooso	Koshara	Wukapão
Mammals	*Lontra longicaudis*	River otter	Saroro	Sarusudi	Sarô
Mammals	*Tayassu pecari*	White-lipped peccary	Poniko	Bichii	Ponjeke

LITERATURE CITED

Acosta, Luis E., Guilherme S.T. Garbino, Germán M. Gasparini, and Rodrigo Parisi Dutra. 2020. "Unraveling the Nomenclatural Puzzle of the Collared and White-Lipped Peccaries (Mammalia, Cetartiodactyla, Tayassuidae)." *Zootaxa* 4851 (1): 60–80. https://doi.org/10.11646/zootaxa.4851.1.2.

Adams, Clare, Luke Hoekstra, Morgan Muell, and Fredric Janzen. 2019. "A Brief Review of Non-Avian Reptile Environmental DNA (eDNA), with a Case Study of Painted Turtle (*Chrysemys picta*) eDNA under Field Conditions." *Diversity* 11 (4): 50. https://doi.org/10.3390/d11040050.

Ahumada, Jorge A., Eric Fegraus, Tanya Birch, Nicole Flores, Roland Kays, Timothy G. O'Brien, Jonathan Palmer, et al. 2019. "Wildlife Insights: A Platform to Maximize the Potential of Camera Trap and Other Passive Sensor Wildlife Data for the Planet." *Environmental Conservation* 47 (1): 1–6. https://doi.org/10.1017/s0376892919000298.

Aleixo, Alexandre, Fabíola Poletto, Maria de Fátima Cunha Lima, Marcelo Castro, Eduardo Portes, and Leonardo de Sousa Miranda. 2011. "Notas sobre os Vertebrados do Norte do Pará, Brasil: Uma Parte Esquecida da Região das Guianas, II. Avifauna." *Boletim do Museu Paraense Emilio Goeldi Ciencias Naturais* 6(1): 11–65. http://scielo.iec.gov.br/scielo.php?script=sci_arttext&pid=S1981-81142011000100002&lng=pt&nrm=iso.

Alemán, Stephanie Weparu. 2005. "Interconnecting Waiwai Theories of Nature, Society, and Identity: An Exploration of Our Understanding of the Relationships Between Amerindians in Southern Guyana, Their Ambient Environment and Their Perceptions of Community and Personhood." PhD diss., University of Wisconsin.

Aleva, Gerardus J.J. 1979. "Bauxite and Other Duricrusts in Surinam: A Review." *Geologie en Mijnbouw* 58: 321–36.

Aleva, Gerardus J.J. 1984. "Laterization, Bauxitization and Cyclic Landscape Development in the Guiana Shield." In *Bauxite: Proceedings of the 1984 Bauxite Symposium: Los Angeles, California*, Edited by L. J. Jacob. American Institute of Mining, Metallurgical and Petroleum Engineers.

Alofs, Karen M., Elford A.Liverpool, Donald C. Taphorn, Calvin R. Bernard, and Hernán López-Fernández. 2013. "Mind the (Information) Gap: The Importance of Exploration and Discovery for Assessing Conservation Priorities for Freshwater Fish." *Diversity and Distributions* 20 (1): 107–13. https://doi.org/10.1111/ddi.12127.

Alonso, Leeanne E., Jennifer McCullough, Piotr Naskrecki, and Eustace Alexander, eds. 2008. *A Rapid Biological Assessment of the Konashen Community Owned Conservation Area, Southern Guyana*. RAP Bulletin of Biological Assessment 51. Conservation International. https://doi.org/10.1896/978-1-934151-24-2.

Alonso, Leeanne E., Juliana Persaud, and Aiesha Williams, eds. 2016. *Biodiversity Assessment Survey of the South Rupununi Savannah, Guyana*. BAT Survey Report No. 1. World Wildlife Fund-Guianas. Georgetown, Guyana. https://www.wwfguianas.org/?295251/BAT%2Dsurvey%2Dreport.

Alonso, Leeanne E., Juliana Persaud, and Aiesha Williams, eds. 2018. *Biodiversity Assessment Survey of the Upper Berbice Region, Guyana*. BAT Survey Report No. 3. World Wildliife Fund-Guianas. Georgetown, Guyana. https://www.wwf.mg/en/?333470/Third-Biological-Assessment-Team-Survey-uncovers-rich-biodiversity-of-the-Upper-Berbice-region--Area-never-before-studied-by-biologists.

Arita, Héctor T., John G. Robinson, and Kent H. Redford. 1990. "Rarity in Neotropical Forest Mammals and its Ecological Correlates." *Conservation Biology* 4(2): 181–92. https://doi.org/10.1111/j.1523-1739.1990.tb00107.x.

Ascorra, César F., Don E. Wilson, and Mónica Romo. 1991. "Lista Anotada de los Quirópteros del Parque Nacional Manu, Perú." *Publicaciones del Museo de Historia Natural. Universidad Nacional Mayor de San Marcos (A)* 42: 1–14.

Atalay, Sonia. 2012. *Community-Based Archaeology: Research with, by, and for Indigenous and Local Communities*. University of California Press.

Avila-Pires, Teresa Cristina Sauer, Marinus Steven Hoogmoed, and Wáldima Alves da Rocha. 2010. "Notes on the Vertebrates of Northern Pará, Brazil: A Forgotten Part of the Guiana Region, I. Herpetofauna." *Boletim do Museu Paraense Emílio Goeldi, Ciências Naturais* 5(1): 13–112. http://repositorio.museu-goeldi.br/handle/mgoeldi/226.

AVMA. 2013. *AVMA Guidelines for the Euthanasia of Animals: 2013 Edition*. American Veterinary Medical Association. Schaumburg, USA. https://www.in.gov/boah/files/AVMA_Euthanasia_Guidelines.pdf.

AVMA. 2020. *AVMA Guidelines for the Euthanasia of Animals: 2020 Edition*. American Veterinary Medical Association. Schaumburg, USA. https://www.avma.org/sites/default/files/2020-02/Guidelines-on-Euthanasia-2020.pdf.

Bánki, Olaf, and Chequita Bhikhi. 2012. "Plant Diversity and Composition of the Forests in the Surroundings of Kwamalasamutu." In *A Rapid Biological Assessment of the Kwamalasamutu Region, Southwestern Suriname*, edited by Brian J. O'Shea, B., Leeanne E. Alonso, and Trond H. Larsen. RAP Bulletin of Biological Assessment 63. Conservation International. https://doi.org/10.1896/054.063.0104.

Barthe, M., Loïs Rancilhac, Maria C. Arteaga, Anderson Feijó, Marie-Ka Tilak, Fabienne Justy, et al. 2025. "Exon Capture Museomics Deciphers the Nine-Banded Armadillo Species Complex and Identifies a New Species Endemic to the Guiana Shield." *Systematic Biology* 74(2): 177–97. https://doi.org/10.1093/sysbio/syae027.

Bartram, Edwin B. 1939. "Mosses of Interior British Guiana." *Bulletin of the Torrey Botanical Club* 66(4): 221–30. http://www.jstor.org/stable/2480862.

Beck, Harald, Joel W. Snodgrass, and Paporn Thebpanya. 2013. "Long-term Exclosure of Large Terrestrial Vertebrates: Implications of Defaunation for Seedling Demographics in the Amazon Rainforest." *Biological Conservation* 163: 115–21. https://doi.org/10.1016/j.biocon.2013.03.012.

Bernard, Curtis. 2014. "Enabling Conservation Concessions in the Context of Guyana's Low-Carbon Development Strategy." Master's thesis, Duke University. https://hdl.handle.net/10161/8538.

Berrangé, Jevan P. 1977. *The geology of Southern Guyana, South America*. Institute of Geological Sciences, Overseas Memoir No 4.

Berrangé, Jevan P. 2015. *Operation El Dorado: A geological mapping project in Southern Guyana 1966–1971*. Self published.

Berrangé, Jevan P., and Richard L. Johnson. 1972. "A Guide to the Upper Essequibo River, Guyana." *Geographical Journal* 138(1): 41–52. https://doi.org/10.2307/1797438.

Bicknell, Jake E., Murray B. Collins, Rob S. Pickles, Niall P. McCann, Curtis R. Bernard, Damian J. Fernandes, et al. 2017. "Designing Protected Area Networks that Translate International Conservation Commitments into National Action." *Biological Conservation* 214: 168–75. https://doi.org/10.1016/j.biocon.2017.08.024.

BirdLife International and Handbook of the Birds of the World. 2024. "Bird Species Distribution Maps of the World. Version 2024.2." http://datazone.birdlife.org/species/requestdis.

Blake, Emmet R. 1950. "Birds of the Acary Mountains." *Fieldiana, Zoology* 32: 417–74. https://www.biodiversitylibrary.org/bibliography/2784.

Blake, John G., and Bette A. Loiselle. 2024. "Sharp Declines in Observation and Capture Rates of Amazon Birds in Absence of Human Disturbance." *Global Ecology and Conservation* 51: e02902. https://doi.org/10.1016/j.gecco.2024.e02902.

Bodmer, Richard E. 1990. "Responses of Ungulates to Seasonal Inundations in the Amazon Floodplain." *Journal of Tropical Ecology*: 6(2): 191–201. https://doi.org/10.1017/S0266467400004314.

Boyle, Brad, Nicole Hopkins, Zhenyuan Lu, Juan Antonio Raygoza Garay, Dmitry Mozzherin, Tony Rees, et al. 2013. "The Taxonomic Name Resolution Service: An Online Tool for Automated Standardization of Plant Names." *BMC Bioinformatics* 14(1): 16. https://doi.org/10.1186/1471-2105-14-16.

Boyle, Brad L., Naim Matasci, Dmitry Mozzherin, Tony Rees, George C. Barbosa, Rohith Kumar Sajja, and Brian J. Enquist. 2021. "Taxonomic Name Resolution Service, version 5.1." Botanical Information and Ecology Network. https://tnrs.biendata.org/.

Braun, Michael. J., Davis W. Finch, Mark B. Robbins, and Brian K. Schmidt. 2007. *A Field Checklist of the Birds of Guyana, 2nd Ed.* Smithsonian Institution, Washington, D.C. https://naturalhistory.si.edu/sites/default/files/media/file/birdchecklist2ndedition_4.pdf.

Bridges, John. 1985. *Rupununi Mission: The Story of Cuthbert Cary-Elwes S J Among the Indians of Guiana 1909–1923.* Jesuits Mission.

Brown, Charles Barrington. 1873. "Indian Picture Writing in British Guiana." *The Journal of the Anthropological Institute of Great Britain and Ireland* 2: 254–57. https://www.jstor.org/stable/2841173.

Brown, Charles Barrington. 1876. *Canoe and Camp Life in British Guiana*. Edward Stanford. https://hdl.handle.net/2027/nyp.33433081692281.

Brown, Charles Barrington, and James Gay Sawkins. 1875. *Reports on the physical, descriptive, and economic geology of British Guiana*. Her Majesty's Stationery Office.

Burnett, D. Graham. 2000. *Masters of All They Surveyed: Exploration, Geography, and a British El Dorado*. University of Chicago Press.

Butt Colson, Audrey. 1973. "Intertribal Trade in the Guiana Highlands." *Anthropologica* 34: 1–70.

Butt Colson, Audrey, and John Morton. 1982. "Early Missionary Work among the Taruma and Waiwai of Southern Guiana: The Visits of Fr. Cuthbert Cary-Elwes, S.J. in 1919, 1922 & 1923." *Folk* 24: 203–61.

Cantera, Isabel, Kévin Cilleros, Alice Valentini, Axel Cerdan, Tony Dejean, Amaia Iribar, et al. 2019. "Optimizing Environmental DNA Sampling Effort for Fish Inventories in Tropical Streams and Rivers." *Scientific Reports* 9: 3085. https://doi.org/10.1038/s41598-019-39399-5.

Cantera, Isabel, Jean-Baptiste Decotte, Tony Dejean, Jérôme Murienne, Régis Vigouroux, Alice Valentini, et al. 2022a. Characterizing the spatial signal of environmental DNA in river systems using a community ecology approach. *Molecular Ecology Resources* 22: 1274–83. https://doi.org/10.1111/1755-0998.13544.

Cantera, Isabel, Opale Coutant, Céline Jézéquel, Jean-Baptiste Decotte, Tony Dejean, Amaia Iribar, et al. 2022b. "Low Level of Anthropization Linked to Harsh Vertebrate Biodiversity Declines in Amazonia." *Nature Communications* 13: 3290. https://doi.org/10.1038/s41467-022-30842-2.

Cilleros, Kévin, Alice Valentini, Luc Allard, Tony Dejean, Roselyne Etienne, Gaël Grenouillet, et al. 2019. "Unlocking Biodiversity and Conservation Studies in High-diversity Environments Using Environmental DNA (eDNA): A Test with Guianese Freshwater Fishes." *Molecular Ecology Resources* 19: 27–46. https://onlinelibrary.wiley.com/doi/abs/10.1111/1755-0998.12900.

CI-Guyana. 2002. *Management Plan for Conservation International's Proposed Conservation Concession in the Upper Essequibo: 2002–2006*. Conservation International Foundation (Guyana) Inc. Georgetown, Guyana.

CI-Guyana. 2007. *Management Plan for Conservation International's Proposed Conservation Concession in the Upper Essequibo: 2007–2012*. Conservation International Foundation (Guyana) Inc. Georgetown, Guyana.

CI-Guyana. 2013. *Experiences and Impacts of the Conservation Concession Model in Guyana (Draft)*. Conservation International Foundation (Guyana) Inc. Georgetown, Guyana.

Chao, Anne, Nicholas J. Gotelli, T. C. Hsieh, Elizabeth L. Sander., K. H. Ma, Robert K. Colwell, et al. 2014. "Rarefaction and Extrapolation with Hill Numbers: A Framework for Sampling and Estimation in Species Diversity Studies." *Ecological Monographs* 84: 45–67. https://doi.org/10.1890/13-0133.1.

Clarke, H. David, Vicki A. Funk, and Thomas H. Hollowell. 2001. "Plant Diversity of the Iwokrama Forest, Guyana." *SIDA, Botanical Miscellany* 21: 1–86. https://repository.si.edu/handle/10088/6441.

Clements, James F., Pamela C. Rasmussen, Thomas S. Schulenberg, Marshall J. Iliff, Thomas A. Fredericks, Jeff A. Gerbracht, et al. 2023. "The eBird/Clements Checklist of Birds of the World: v2023." Downloaded from https://www.birds.cornell.edu/clementschecklist/download/.

Cole, Charles J., Carol R. Townsend, Robert P. Reynolds, Ross D. MacCulloch, and Amy Lathrop. 2013. "Amphibians and Reptiles of Guyana, South America: Illustrated Keys, Annotated Species Accounts, and a Biogeographic Synopsis." *Proceedings of the Biological Society of Washington* 125(4): 317–578. https://doi.org/10.2988/0006-324X-125.4.317.

Condachou, Céline, Opale Coutant, Sébastien Brosse, and Jérôme Murienne. 2024. "Evaluating the eDNA Spatial Signal in Natural Populations and its Application for the Monitoring of the Threatened *Harttiella* (Siluriformes, Loricariidae)." *Limnology and Oceanography: Methods* 22: 660–9. https://doi.org/10.1002/lom3.10634.

Convention on Biological Diversity. 2022a. *Kunming-Montreal Global Biodiversity Framework*. Document CBD/COP/15/L.25. https://www.cbd.int/conferences/2021-2022/cop-15/documents.

Convention on Biological Diversity. 2022b. *Monitoring Framework for the Kunming-Montreal Global Biodiversity Framework*. Document CBD/COP/DEC/15/5. https://www.cbd.int/doc/decisions/cop-15/cop-15-dec-05-en.pdf.

Coutant, Opale, Isabel Cantera, Kévin Cilleros, Tony Dejean, Alice Valentini, Jérôme Murienne, and Sébastien Brosse. 2021a. "Detecting Fish Assemblages with Environmental DNA: Does Protocol Matter? Testing eDNA Metabarcoding Method Robustness." *Environmental DNA* 3: 619–30. https://doi.org/10.1002/edn3.158.

Coutant, Opale, Cécile Richard-Hansen, Benoit de Thoisy, Jean-Baptiste Decotte, Alice Valentini, Tony Dejean, et al. 2021b. "Amazonian Mammal Monitoring Using Aquatic Environmental DNA." *Molecular Ecology Resources* 21: 1875–88. https://doi.org/10.1111/1755-0998.13393.

Cortes-Ortiz, Liliana, and Marcella D. Nidiffer. 2016. "Gene Flow and Species Boundaries in Howler Monkeys." *American Journal of Physical Anthropology* 159: 122.

Crump, Martha L., and Norman J. Scott, Jr. 1994. "Visual Encounter Surveys." In *Measuring and Monitoring Biological Diversity, Standard Methods for Amphibians*, edited by W. Ronald Heyer, Maureen A. Donnelly, Roy W. McDiarmid, Lee-Ann C. Hayek, and Mercedes S. Foster. Smithsonian Institution Press.

Curtis, Amanda N., Jeremy S. Tiemann, Sarah A. Douglass, Mark A. Davis, and Eric R. Larson. 2021. "High Stream Flows Dilute Environmental DNA (eDNA) Concentrations and Reduce Detectability." *Diversity and Distributions* 27(10): 1918–31. https://doi.org/10.1111/ddi.13196.

David, B., P. Isaacs, A. Johnny, L. Johnson, M. Pugsley, C. Ramacindo, et al. 2006. Wa Wiizi – Wa Kaduzu (Our territory – Our Custom): Customary Use of Biological Resources and Related Traditional Practices within Wapichan Territory in Guyana: An indigenous case study. Abridged version 1.3. Unpublished report prepared by the South Rupununi District Council. http://wapichanao.communitylands.org/1499798142646-wa_wiizi_wa_kaduzu.pdf.

De Milde, R. and D. De Groot. 1970. *Reconnaissance Survey of the Southern Part of Guyana*. UNDP/FAO. Georgetown, Guyana.

de Lima, Robson Borges, Eric Bastos Görgens, Diego Armando S. da Silva, Cinthia Pereira de Oliveira, Anderson Pedro B. Batista, Rinaldo L. Caraciolo Ferreira, et al. 2023. "Giants of the Amazon: How Does Environmental Variation Drive the Diversity Patterns of Large Trees?" *Global Change Biology* 29: 4861–79. https://doi.org/10.1111/gcb.16821.

de Souza Lima, Edson, Karen E. DeMatteo, Rodrigo S. Jorge, Maria Luisa S. Jorge, Julio Cesar Dalponte, Herson Souza Lima, et al. 2012. "First Telemetry Study of Bush Dogs: Home Range, Activity and Habitat Selection." *Wildlife Research* 39(6): 512–9. https://doi.org/10.1071/WR11176.

de Souza, Lesley S., Armbruster, Jonathan W., and David C. Werneke. 2012. "The Influence of the Rupununi Portal on Distribution of Freshwater Fish in the Rupununi District, Guyana." *Cybium* 36(1): 31–43. https://webhome.auburn.edu/~armbrjw/Rupununi_portal.pdf.

de Souza, Lesley S., James C. Godwin, Mark A. Renshaw, and Eric Larson. 2016. "Environmental DNA (eDNA) Detection Probability is Influenced by Seasonal Activity of Organisms." *PLoS One* 11(10): e0165273. https://doi.org/10.1371/journal.pone.0165273.

de Souza, Lesley S., Jonathan W. Armbruster, and Philip W. Willink. 2020. "Connectivity of Neotropical River Basins in the Central Guiana Shield Based on Fish Distributions." *Frontiers in Forests and Global Change* 3: 8. https://doi.org/10.3389/ffgc.2020.00008.

Dhiram, Komalchand, K. Samaroo, J. Jagdeo, et al. 2025. "Rainfall Data (1981–2024) Generated Using Satellite (CHIRPS) and Ground Rain Gauge Blending Methods via the Climate Data Tool." Hydrometeorological Service, Ministry of Agriculture. Georgetown, Guyana. Unpublished Dataset. http://181.199.253.14/maproom/Climatology/index.html.

Díaz Alván, Juan, Flora Á. Peña Alzate, Douglas F. Stotz, and Debra K. Moskovits. 2021. "Birds." In *Colombia, Perú: Bajo Putumayo-Yaguas-Cotuhé*, edited by Christopher C. Jarrett, Michelle E. Thompson, Nigel Pitman, Corine F. Vriesendorp, Diana Alvira Reyes, Ana A. Lemos, et al. The Field Museum.

Dorr, Laurence J. 2022. "A New Species of *Hibiscus* (Malvaceae, Malvoideae) from Guyana." *PhytoKeys* 214: 1–6. https://doi.org/10.3897/phytokeys.214.91586.

dos Santos-Filho, Manoel, Dionei J. da Silva, and Tânia M. Sanaiotti. 2006. "Efficiency of Four Trap Types in Sampling Small Mammals in Forest Fragments, Mato Grosso, Brazil." *Mastozoología Neotropical* 13(2): 217–25. https://mn.sarem.org.ar/article/efficiency-of-four-trap-types-in-sampling-small-mammals-in-forest-fragments-mato-grosso-brazil/.

Dubelaar, Cornelis N. 1986. *The Petroglyphs in the Guianas and Adjacent Areas of Brazil and Venezuela: An Inventory with a Comprehensive Bibliography of South American and Antillean Petroglyphs*. Monumenta Archaeologica 12. The Institute of Archeology, University of California, Los Angeles.

Duin, Renzo S. 2017. "Written in Stone: Revisiting Early Studies on Timehri Petroglyphs in Suriname." In *Archaeology in Suriname*, edited by Renzo S. Duin and Cheryl White. Instituut voor Maatschappijwetenschappelijk Onderzoek (IMWO).

Dutra, Guilherme M., Tiago Freitas, Bruno S. Prudente, Gilberto N. Salvador, Manuela D. Leão, Luiz A. Peixoto, et al. 2020. "Rapid Assessment of the Ichthyofauna of the Southern Guiana Shield Tributaries of the Amazonas River in Pará, Brazil." *Acta Amazonica* 50: 24–36. https://doi.org/10.1590/1809-4392201901402.

Edmond, J.M., M.R. Palmer, C.I. Measures, B. Grant, and Robert F. Stallard. 1995. "The Fluvial Geochemistry and Denudation Rate of the Guayana Shield in Venezuela, Colombia, and Brazil." *Geochimica et Cosmochimica Acta* 59(16): 3301–25. https://doi.org/10.1016/0016-7037(95)00128-M.

Eisenberg, John F. 1989. *Mammals of the Neotropics, Volume 1: The Northern Neotropics: Panama, Colombia, Venezuela, Guyana, Suriname, French Guiana*. University of Chicago Press.

Emmons, Louise H. 1987. "Comparative Feeding Ecology of Felids in a Neotropical Rainforest." *Behavioral Ecology and Sociobiology* 20: 271–83. https://doi.org/10.1007/bf00292180.

Engert, Jayden E., Carlos M. Souza, Fritz Kleinschroth, Diego Juffe Bignoli, Stefany C.P. Costa, Jonas Botelho, Jr., et al. 2025. "Explosive Growth of Secondary Roads is Linked to Widespread Tropical Deforestation." *Current Biology* 35(7): P1641–8. https://doi.org/10.1016/j.cub.2025.02.017.

Environmental Management Consultants. 2012. *Draft Environmental and Social Impact Assessment Report, Logging and Sawmilling Operations, Upper Essequibo, Region 9*. Unpublished report commissioned by Simon and Shock International Logging, Inc.

Exponent. 2011. *Amaila Hydropower Project ESIA Addendum: Complementary Baseline Survey Results*. Bellevue, Washington. https://www.iadb.org/en/project/GY-T1075.

Evans, Clifford, and Betty J. Meggers. 1960. *Archeological Investigations in British Guiana*. United States Government Printing Office.

Fa, Julia E., and David Brown. 2009. "Impacts of Hunting on Mammals in African Tropical Moist Forests: A Review and Synthesis." *Mammal Review* 39(4): 231–64. https://doi.org/10.1111/j.1365-2907.2009.00149.x.

Farabee, William C. 1916. "Some South American Petroglyphs." In *Holmes Anniversary Volume: Anthropological Essays presented to William Henry Holmes*, edited by F. W. Hodge. J. W. Bryan Press.

Farabee, William C. 1924. *The Central Caribs*. Anthropological Publications, Vol. X. University of Pennsylvania, The University Museum.

Fock, Niels. 1963. *Waiwai: Religion and Society of an Amazonian Tribe*. The National Museum, Copenhagen.

Foster, Rebecca J., Bart J. Harmsen, and C. Patrick Doncaster. 2010. "Habitat Use by Sympatric Jaguars and Pumas Across a Gradient of Human Disturbance in Belize." *Biotropica* 42(6): 724–31. https://doi.org/10.1111/j.1744-7429.2010.00641.x.

Fouquet, Antoine, Jean-Pierre Vacher, Vanessa Kadosoe, Paul Ouboter, and Rawien Jairam. 2015. "Checklist of the Amphibians of the Sipaliwini Area, Suriname." *Herpetology Notes* 8: 63–8. https://biotaxa.prod.amazon.auckland.ac.nz/hn/article/view/9473.

Fouquet, Antoine, Killian Leblanc, Marlene Framit, Alexandre Réjaud, Miguel Trefaut Rodrigues, Santiago Castroviejo-Fisher, et al. 2021. "Species Diversity and Biogeography of an Ancient Frog Clade from the Guiana Shield (Anura: Microhylidae: Adelastes, Otophryne, *Synapturanus*) Exhibiting Spectacular Phenotypic Diversification." *Biological Journal of the Linnean Society* 132(2): 233–56. https://doi.org/10.1093/biolinnean/blaa204.

Fouquet, Antoine, Philippe J. Kok, Renato Sousa Recoder, Ivan Prates, Agustin Camacho, Sergio Marques-Souza, et al. 2024. "Relicts in the Mist: Two New Frog Families, Genera and Species Highlight the Role of Pantepui as a Biodiversity Museum Throughout the Cenozoic." *Molecular Phylogenetics and Evolution* 191: 107971. https://doi.org/10.1016/j.ympev.2023.107971.

Fragoso, José M., André P. Antunes, Kirsten M. Silvius, Pedro A. Constantino, Galo Zapata-Ríos, Hani R. El Bizri, et al. 2022. "Large-scale Population Disappearances and Cycling in the White-lipped Peccary, a Tropical Forest Mammal." *PLoS One* 17(10): e0276297. https://doi.org/10.1371/journal.pone.0276297.

Fragoso, José M., Fernando Goncalves, Luiz F. B. Oliveira, Han Overman, Taal Levi, and Kirsten M. Silvius. 2019. "Visual Encounters on Line Transect Surveys Under-Detect Carnivore Species: Implications for Assessing Distribution and Conservation Status." *PLoS One* 14(10): e0223922. https://doi.org/10.1371/journal.pone.0223922.

Fragoso, José M., Taal Levi, Luiz F. B. Oliveira, Jeffrey B. Luzar, Han Overman, Jane M. Read, et al. 2016. "Line Transect Surveys Underdetect Terrestrial Mammals: Implications for the Sustainability of Subsistence Hunting." *PLoS One* 11(4): e0152659. https://doi.org/10.1371/journal.pone.0152659.

Fricke, Ron, William N. Eschmeyer, and Richard Van der Laan, eds. 2025. "Eschmeyer's Catalog of Fishes: Genera, Species, References." Electronic version accessed 18 March 2025. https://researcharchive.calacademy.org/research/ichthyology/catalog/fishcatmain.asp.

Frost, Darrel R. 2024. "Amphibian Species of the World: an Online Reference, Version 6.2." Electronic Database accessible at https://amphibiansoftheworld.amnh.org/index.php. American Museum of Natural History, New York, USA. https://doi.org/10.5531/db.vz.0001.

Gajapersad, Krisna, Angelique Mackintosh, Angelica Benitez, and Estéban Payán. 2011. "A Survey of the Large Mammal Fauna of the Kwamalasamutu Region, Suriname." In *A Rapid Biological Assessment of the Kwamalasamutu Region, Southwestern Suriname*, edited by Brian J. O'Shea, Leeanne E. Alonso, and Trond H. Larsen. RAP Bulletin of Biological Assessment 63. Conservation International. https://doi.org/10.1896/054.063.0115.

Gallagher, Rachael V., Stuart P. Allen, Rafaël Govaerts, Malin C. Rivers, Andrew P. Allen, David A. Keith, et al. 2023. "Global Shortfalls in Threat Assessments for Endemic Flora by Country." *Plants, People, Planet* 5(6): 885–98. https://doi.org/10.1002/ppp3.10369.

GFC. 2006. *Management Level Inventory (0.1 Percent Sampling Intensity) in the Conservation International Conservation Concession (FCA#1/2002)*. Unpublished report of the Guyana Forestry Commission (GFC). Georgetown, Guyana.

Gibbs, Allan K., and Christopher N. Barron. 1983. "The Guiana Shield Reviewed." *Episodes* 6(2): 7–14. https://doi.org/10.18814/epiiugs/1983/v6i2/003.

Gibbs, Allan K., and Christopher N. Barron. 1993. *The Geology of the Guiana Shield*. Oxford Monographs on Geology and Geophysics Vol. 22. Oxford University Press.

GLSC. 2013. *Guyana National Land Use Plan*. Guyana Lands and Surveys Commission (GLSC), Ministry of Natural Resources and Environment. Georgetown, Guyana.

Gold, Zachary, Emily E. Curd, Kelly D. Goodwin, Emma S. Choi, Benjamin W. Frable, Andrew R. Thompson, et al. 2021. "Improving Metabarcoding Taxonomic Assignment: A Case Study of Fishes in a Large Marine Ecosystem." *Molecular Ecology Resources* 21: 2546–64. https://doi.org/10.1111/1755-0998.13450.

Gorgens, Eric Bastos, Alline Zagnoli Motta, Mauro Assis, Matheus Henrique Nunes, Tobias Jackson, David Coomes, et al. 2019. "The Giant Trees of the Amazon Basin." *Frontiers in Ecology and the Environment* 17: 373–4. https://core.ac.uk/download/pdf/237198023.pdf.

Govaerts, Rafaël, ed. 2023. "WCVP: World Checklist of Vascular Plants, Version 12." Royal Botanic Gardens, Kew. http://sftp.kew.org/pub/data-repositories/WCVP/.

Government of Guyana. 2022. *Guyana's Low Carbon Development Strategy 2030: A New Low Carbon Economy*. Georgetown, Guyana. https://lcds.gov.gy.

Hallett, Matthew, Sarina Kawall, Meshach Pierre, Alyssa Melville, Michelle Kenyon, Kayla de Freitas, et al. 2024b. "Coexistence Between People, Livestock and Carnivores in the Rupununi." In *Wildlife and People in the Rupununi: A Comprehensive Assessment Based on Science and Local Knowledge*, edited by Nathalie van Vliet, Nicole Ponta, Sébastien LeBel, Luke McKenna, and Oswin David. FAO, CIRAD, CIFOR-ICRAF, and WCS. https://doi.org/10.4060/cd0660en.

Hallett, Matthew T., Anouska A. Kinahan, Rayon McGregor, Thadaigh Baggallay, Timothy Babb, Howard Barnabus, et al. 2019. "Impact of Low-Intensity Hunting on Game Species in and Around the Kanuku Mountains Protected Area, Guyana." *Frontiers in Ecology and Evolution* 7: 412. https://doi.org/10.3389/fevo.2019.00412.

Hallett, Matthew T., Anthony Roberts, Ashley P. Holland, and Angus Jackman. 2021. "First Photographic Records of Bush Dogs (*Speothos venaticus*) from Camera-traps in Guyana." *Mammalia* 85: 150–4. https://doi.org/10.1515/mammalia-2019-0111.

Hallett, Matthew T., Francesco Rovero, Nathalie van Vliet, Fernando M. Li, Rhomayne Li, Jeremy Melville, et al. 2024a. "Medium- and Large-bodied Terrestrial Mammal Communities in Makushi and Wapichan Indigenous Titled Customary Lands in the Rupununi, Guyana." In *Wildlife and people in the Rupununi: A Comprehensive Assessment Based on Science and Local Knowledge*, edited by Nathalie van Vliet, Nicole Ponta, Sébastien LeBel, Luke McKenna, and Oswin David. FAO, CIRAD, CIFOR-ICRAF, and WCS. https://doi.org/10.4060/cd0660en.

Harris, Arianne E., Matthew T. Hallett, Micah Davis, Martin Carter, Dwarka Singh, Anand Roopsind, et al. 2023. "Use of Logging Roads by Terrestrial Mammals in a Responsibly Managed Neotropical Rainforest in Guyana." *Forest Ecology and Management* 548: 121401. https://doi.org/10.1016/j.foreco.2023.121401.

Harvey, Celia A., and Jorge A. Gonzalez Villalobos. 2007. "Agroforestry Systems Conserve Species-rich but Modified Assemblages of Tropical Birds and Bats." *Biodiversity Conservation* 16: 2257–92. https://doi.org/10.1007/s10531-007-9194-2.

Helbig-Bonitz, Maria, Stefan W. Ferger, Katrin Böhning-Gaese, Marko Tschapka, Kim Howell, and Elisabeth K.V. Kalko. 2015. "Bats Are Not Birds: Different Responses to Human Land-use on a Tropical Mountain." *Biotropica* 47(4): 497–508. https://doi.org/10.1111/btp.12221.

Henfrey, Thomas B. 2002. "Ethnoecology, resource use, conservation and development in a Wapishana community in the South Rupununi, Guyana." PhD diss., University of Kent at Canterbury.

Henkel, Terry W., Carol L. Kelloff, Sara N. Alexander, and Vicki A. Funk. 2016. "Smithsonian Plant Collections, Guyana: 1992–2014, Terry W. Henkel." *Smithsonian Contributions to Botany* 104: 1–206. https://tropicalfungi.org/wp-content/uploads/Henkel-et-al.-2016-Smithsonian-Plant-Collections-SICB.pdf.

Hershkovitz, Philip. 1985. "A Preliminary Taxonomic Review of South American Bearded Saki Monkeys Genus Chiropotes (Cebidae, Platyrrhini) with Description of a New Subspecies." *Fieldiana, Zoology* 27: 1–46. https://www.biodiversitylibrary.org/itemdetails/21475.

Heyer, W. Ronald, Maureen A. Donnelly, Roy W. McDiarmid, Lee-Ann C. Hayek, and Mercedes S. Foster, eds. 1994. *Measuring and Monitoring Biological Diversity: Standard Methods for Amphibians*. Smithsonian Institution.

Hill, Andrew P., Peter Prince, Jake L. Snaddon, C. Patrick Doncaster, and Alex Rogers. 2019. "AudioMoth: A Low-cost Acoustic Device for Monitoring Biodiversity and the Environment." *HardwareX* 6: e00073. https://doi.org/10.1016/j.ohx.2019.e00073.

Holden, William H. 1938. "Civilization and Sudden Death." *Natural History* XLII(5): 328–37.

Howard, Catherine V. 1991. "Fragments of the Heavens: Feathers as Ornaments Among the Waiwai." In *The Gift of Birds: Featherwork of Native South American Peoples*, edited by Ruben R. Reina and Kenneth M. Kensinger. The University Museum of Archaeology and Anthropology.

Howard, Catherine V. 2001. "Wrought Identities: The Waiwai Expeditions in Search of the 'Unseen Tribes' of Northern Amazonia." PhD. diss., University of Chicago.

im Thurn, Everard F. 1883. *Among the Indians of Guiana: Being Sketches Chiefly Anthropologic from the Interior of British Guiana*. Kegan Paul.

IUCN 2024. *The IUCN Red List of Threatened Species*. International Union for Conservation of Nature (IUCN). https://www.iucnredlist.org/.

IUCN and WCPA. 2017. *IUCN Green List of Protected and Conserved Areas: Standard, Version 1.1.* International Union for Conservation of Nature (IUCN) and World Commission on Protected Areas (WCPA). Gland, Switzerland. https://iucngreenlist.org/standard/global-standard/.

IUCN-WCPA Task Force on OECMs. 2019. *Recognising and reporting other effective area-based conservation measures*. International Union for the Conservation of Nature (IUCN) and World Commission on Protected Areas (WCPA). Gland, Switzerland. https://portals.iucn.org/library/sites/library/files/documents/PATRS-003-En.pdf.

Jędrzejewski, Wlodzimierz, Ronaldo G. Morato, Nuno Negrões, Robert B. Wallace, Agustin Javier Paviolo, Carlos Daniel de Angelo, et al. 2023. "Estimating Species Distribution Changes Due to Human Impacts: The 2020's Status of the Jaguar in South America." *Cat News* 16: 44–55. http://hdl.handle.net/11336/242200.

Jenkins, Clinton N., Stuart L. Pimm, and Lucas N. Joppa. 2013. "Global Patterns of Terrestrial Vertebrate Diversity and Conservation." *Proceedings of the National Academy of Sciences* 110: E2602–10. https://doi.org/10.1073/pnas.1302251110.

Jetz, Walter, Jana M. McPherson, and Robert P. Guralnick. 2012. "Integrating Biodiversity Distribution Knowledge: Toward a Global Map of Life." *Trends in Ecology and Evolution* 27: 151–9. https://doi.org/10.1016/j.tree.2011.09.007.

Jiménez Espinosa, Esequiel Rolando, Donessa Lucinda David, and Tracey Shennez Alleyne. 2022. "Soil Physical Properties and Textural Map in Guyana." *Tropical Agriculture (Trinidad)* 99(3): 268–81. https://journals.sta.uwi.edu/ojs/index.php/ta/article/view/8284.

Jullien, Mathilde, and Jean-Marc Thiollay. 1998. "Multi-species Territoriality and Dynamic of Neotropical Forest Understorey Bird Flocks." *Journal of Animal Ecology* 67: 227–52. https://doi.org/10.1046/j.1365-2656.1998.00171.x.

Kaehler, Benjamin D., Nicholas A. Bokulich, Daniel McDonald, Rob Knight, J. Gregory Caporaso, and Gavin A. Huttley. 2019. "Species Abundance Information Improves Sequence Taxonomy Classification Accuracy." *Nature Communications* 10: 4643. https://doi.org/10.1038/s41467-019-12669-6.

Kelloff, Carol L., Sara N. Alexander, Vicki A. Funk, and H. David Clarke. 2011. "Smithsonian Plant Collections, Guyana: 1995–2004, H. David Clarke." *Smithsonian Contributions to Botany* 97: 1–307. https://naturalhistory.si.edu/sites/default/files/media/file/clarkecollectorpublication2011accessible.pdf.

Kelloff, Carol L., Karen M. Redden, Kenneth J. Wurdack, and Sara N. Alexander 2023. "Smithsonian Plant Collections, Guiana Shield: 2002–2012, Karen M. Redden and Kenneth J. Wurdack." *Smithsonian Contributions to Botany* 116: 1–242. https://doi.org/10.5479/si.21912828.

King, Lester C. 1956. "A Geomorfologia do Brasil Oriental." *Revista Brasileira de Geografia* 18: 147–265.

King, Lester C. 1957. "A Geomorphological Comparison Between Eastern Brazil and Africa (Central and Southern)." *Geological Society of London Quarterly Journal* 112: 445–74. https://doi.org/10.1144/GSL.JGS.1956.112.01-04.22

King, Lester C. 1967. *The Morphology of the Earth*. Oliver and Boyd.

Kok, Philippe J. R., Sebastian Ratz, Ross D. MacCulloch, Amy Lathrop, Raheleh Dezfoulian, Fabien Aubret, et al. 2018. "Historical Biogeography of the Palaeoendemic Toad Genus *Oreophrynella* (Amphibia: Bufonidae) Sheds a New Light on the Origin of the Pantepui Endemic Terrestrial Biota." *Journal of Biogeography* 45(1): 26–36. https://doi.org/10.1111/jbi.13093.

Lee, Thomas E., Jr., Steven R. Hoofer, Ronald A. Van Den Bussche. 2002. "Molecular Phylogenetics and Taxonomic Revision of the Genus *Tonatia* (Chiroptera: Phyllostomidae)." *Journal of Mammalogy* 83: 49–57. https://doi.org/10.1644/1545-1542(2002)083%3C0049:MPATRO%3E2.0.CO;2.

Lim, Burton, and Mark D. Engstrom. 2001. "Bat Community Structure at Iwokrama Forest, Guyana." *Journal of Tropical Ecology* 17: 647–65. http://dx.doi.org/10.1017/S0266467401001481.

Lim, Burton, and Mark D. Engstrom. 2005. "Species Diversity of Bats (Mammalia: Chiroptera) in Iwokrama Forest, Guyana, and the Guianan Subregion: Implications for Conservation." *Biodiversity and Conservation* 10: 613–57. http://dx.doi.org/10.1023/A:1016660123189.

Lim, Burton K. 2007. "Preliminary Report, Small Mammal Survey, Upper Essequibo Conservation Concession, 14–21 September 2007." In an unpublished report on the visit of the BBC to the forest of the Upper Essequibo, edited by Steve Greenwood, George McGavin, and Eustace Alexander.

Lim, Burton K., and Sahieda Joemratie. 2011. "Rapid Assessment Program (RAP) Survey of Small Mammals in the Kwamalasamutu Region of Suriname." In *A Rapid Biological Assessment of the Kwamalasamutu Region, Southwestern Suriname*, edited by Brian J. O'Shea, Leeanne E. Alonso, and Trond H. Larsen. RAP Bulletin of Biological Assessment 63. Conservation International. https://doi.org/10.1896/054.063.0114.

Lima, J. F. de S., A. Langguth, and Lenilde C. de Sousa. 1998. "The Karyotype of *Makalata didelphoides* (Rodentia, Echimyidae)." *Zeitschrift für Saugetierkunde* 63(5): 315–8.

López-Baucells, Adrià, Ricardo Rocha, Paulo Bobrowiec, Enrico Bernard, Jorge Palmerin, and Christoph Meyer. 2016. *Field Guide to Amazonian Bats*. Editora INPA. https://ppbio.inpa.gov.br/sites/default/files/LopezBaucells_2016_Field_Guide_to_Amazonian_Bats.pdf.

Luedtke, Jennifer A., Janice Chanson, Kelsey Neam, Louise Hobin, Adriano O. Maciel, Alessandro Catenazzi, et al. 2023. "Ongoing Declines for the World's Amphibians in the Face of Emerging Threats." *Nature* 622(7982): 308–14. https://doi.org/10.1038/s41586-023-06578-4.

Luize, Bruno G., Hanna Tuomisto, Robin Ekelschot, Kyle G. Dexter, Iêda L. do Amaral, Luiz de Souza Coelho, et al. 2024. "The Biogeography of the Amazonian Tree Flora." *Communications Biology* 7: 1240. https://doi.org/10.1038/s42003-024-06937-5.

Lumbierres, Maria, Prabhat R. Dahal, Carmen D. Soria, Moreno Di Marco, Stuart H.M. Butchart, Paul F. Donald, et al. 2022. "Area of Habitat Maps for the World's Terrestrial Birds and Mammals." *Scientific Data* 9: 749. https://doi.org/10.1038/s41597-022-01838-w.

Lynch-Alfaro, Jessica W., Jean Paul Boubli, Link E. Olson, Anthony Di Fiore, Bryan Wilson, Gustavo A. Gutiérrez-Espeleta, et al. 2012. "Explosive Pleistocene Range Expansion Leads to Widespread Amazonian Sympatry Between Robust and Gracile Capuchin Monkeys." *Journal of Biogeography* 39(2): 272–88. https://doi.org/10.1111/j.1365-2699.2011.02609.x.

MacDonald, Katherine. 2014. "Impacts of the Cattle Industry and Road Development in the Rupununi, Guyana." *Journal of Latin American Geography* 13(3): 159–82. https://www.jstor.org/stable/24395771.

Malhi, Yadvinder, Daniel Wood, Timothy R. Baker, James Wright, Oliver L. Phillips, Thomas Cochrane, et al. 2006. "The Regional Variation of Aboveground Live Biomass in Old-growth Amazonian Forests." *Global Change Biology* 12(7): 1107–38. https://doi.org/10.1111/j.1365-2486.2006.01120.x.

Mans, Jimmy L. J. A. 2012. *Amotopoan Trails: A Recent Archaeology of Trio Movements*. Mededelingen van het Rijksmuseum voor Volkenkunde.

Map of Life. 2024. *2024 Species protection report*. Yale University. New Haven. https://mol.org/indicators/protection/report.

Martínez, Ari E., José M. Ponciano, Juan P. Gomez, Thomas Valqui, Jorge Novoa, Mariamercedes Antezana, et al. 2023. "The Structure and Organisation of an Amazonian Bird Community Remains Little Changed After Nearly Four Decades in Manu National Park." *Ecology Letters* 26: 335–46. https://doi.org/10.1111/ele.14159.

Martins-Junior, Antonio M. G., Jefferson Carneiro, Iracilda Sampaio, Stephen F. Ferrari, and Horacio Schneider. 2018. "Phylogenetic Relationships Among Capuchin (Cebidae, Platyrrhini) Lineages: An Old Event of Sympatry Explains the Current Distribution of *Cebus* and *Sapajus*." *Genetics and Molecular Biology* 4: 699–712. https://doi.org/10.1590/1678-4685-GMB-2017-0012.

McConnell, R. B. 1968. "Planation Surfaces in Guyana." *Geographical Journal* 134: 506–20. https://doi.org/10.2307/1796379.

Mendes Pontes, Antonio R., Antonio P. da Silva Júnior, and David Chivers. 2020. "The Occurrence of Leucism in Groups of Tayras *Eira barbara* Linnaeus 1758 on the Guyana Shield." *Écoscience* 27: 295–301. https://doi.org/10.1080/11956860.2020.1804724.

Mentore, George. 2000. "Society, Body and Style: An Archery Contest in an Amerindian Society." In *Games, Sports and Cultures*, edited by Noel Dyck. Berg Publishers.

Mentore, George. 2005. *Of Passionate Curves and Desirable Cadences: Themes on Waiwai Social Being*. University of Nebraska Press.

Mentore, Laura. 2010. "Trust and Alterity: Waiwai Analyses of Social and Environmental Relations in Southern Guyana." PhD diss., University of Cambridge.

Mentore, Laura. 2020. "Forever Working on the Whiteman: Agency, Vulnerability, and Hope in the Interstices of an Amazonian Frontier." *Journal of Latin American and Caribbean Anthropology* 25(2) 266–82. https://doi.org/10.1111/jlca.12491.

Mentore, Laura H. 2024. "Replication and Growth in Cassava Cultivation and Uxorilocal Women's Relations Among the Waiwai: A Mother's Reckoning with Death and Social Change." *Tipití: Journal of the Society for the Anthropology of Lowland South America* 20(1): 5. https://doi.org/10.70845/2572-3626.1382.

Merow, Cory, Jenica M. Allen, Matthew Aiello-Lammens, and John A. Silander, Jr. 2016. "Improving Niche and Range Estimates with Maxent and Point Process Models by Integrating Spatially Explicit Information." *Global Ecology and Biogeography* 25: 1022–36. https://doi.org/10.1111/geb.12453.

Metz, M., H. Mitasova, and R. S. Harmon. 2011. "Efficient Extraction of Drainage Networks from Massive, Radar-Based Elevation Models with Least Cost Path Search." *Hydrology and Earth System Sciences* 15: 667–78. https://doi.org/10.5194/hess-15-667-2011.

Miller, B. W. 2001. "A Method for Determining Relative Activity of Free Flying Bats Using a New Activity for Acoustic Monitoring." *Acta Chiropterologica* 3(1): 93–105.

Mol, Jan H., Richard P. Vari, Raphaël Covain, Philip Willink, and Sonia Fisch-Muller. 2012. "Annotated Checklist of the Freshwater Fishes of Suriname." *Cybium* 36(1): 263–92. https://sfi-cybium.fr/sites/default/files/pdfs-cybium/15-Mol2%5BGuianas%5D.pdf.

Mol, Jan H. A., Raphael Covain, and Philip W. Willink. 2025. "Rivers of the North Atlantic." In *Rivers of South America*, edited by Manuel A.S. Graça, Marcos Callisto, Franco Teixeira de Mello, and Douglas Rodríguez-Olarte. Elsevier.

Mones, Alvaro, and Juhani Ojasti. 1986. "*Hydrochoerus hydrochaeris*." *Mammalian Species* 264: 1–7. https://doi.org/10.2307/3503784.

Montambault, Jensen R., and Oliver Missa, eds. 2002. *A Biodiversity Assessment of the Eastern Kanuku Mountains, Lower Kwitaro River, Guyana*. RAP Bulletin of Biological Assessment 26. Conservation International.

Munsell. 1954. *Soil Color Charts*. Munsell Color Company.

Nogueira, Cristiano C., Antonio J. S. Argôlo, Vanesa Arzamendia, Josué A. Azevedo, Fausto E. Barbo, Renato S. Bérnils, et al. 2019. "Atlas of Brazilian Snakes: Verified Point-Locality Maps to Mitigate the Wallacean Shortfall in a Megadiverse Snake Fauna." *South American Journal of Herpetology* 14: 1–274. https://doi.org/10.2994/SAJH-D-19-00120.1.

Oakley, R. Elliott. 2019. "Opening the Waiwai Ewto: Indigenous Social and Spatial Relations in Guyana." PhD diss., University of Edinburgh. https://era.ed.ac.uk/handle/1842/35641.

Oakley, R. Elliott. 2020. "Demarcated Pens and Dependent Pets: Conservation Livelihoods in an Indigenous Amazonian Protected Area." *The Journal of Latin American and Caribbean Anthropology* 25: 248–65. https://doi.org/10.1111/jlca.12479.

O'Farrell, Michael J., Bruce W. Miller, and William L. Gannon. 1999. "Qualitative Identification of Free-flying Bats using the Anabat Detector." *Journal of Mammalogy* 80: 11–23. https://doi.org/10.2307/1383203.

Ondo, Ian, Kiran L. Dhanjal-Adams, Samuel Pironon, Daniele Silvestro, Mateus Colli-Silva, Victor Deklerck, et al. 2024. "Plant Diversity Darkspots for Global Collection Priorities." *New Phytologist* 244: 719–33. https://doi.org/10.1111/nph.20024.

O'Shea, Brian J. 2008. "Birds of the Konashen COCA, Southern Guyana." In *A Rapid Biological Assessment of the Konashen Community Owned Conservation Area, Southern Guyana*, edited by Leeanne E. Alonso, Jennifer McCullough, Piotr Naskrecki, and Eustace Alexander. RAP Bulletin of Biological Assessment 51. Conservation International. https://doi.org/10.1896/054.051.0112.

O'Shea, Brian J., and Serano Ramcharan. 2012. "Avifauna of the Kwamalasamutu Region, Suriname." In *A Rapid Biological Assessment of the Kwamalasamutu Region, Southwestern Suriname*, edited by Brian J. O'Shea, Leeanne E. Alonso, and Trond H. Larsen. RAP Bulletin of Biological Assessment 63. Conservation International. https://doi.org/10.1896/054.063.0113.

O'Shea, Brian J. 2018. "A Rapid Assessment of the Forest Avifauna of the Upper Berbice Region, Guyana." In: *Biodiversity Assessment Survey of the Upper Berbice Region, Guyana*, edited by Alonso, Leeanne E., Juliana Persaud and Aiesha Williams. BAT Survey Report No. 3. World Wildlife Fund-Guianas. Georgetown, Guyana. https://wwflac.awsassets.panda.org/downloads/biodiversity_assessment_survey_of_the_upper_berbice_region_2018.pdf.

Ottema, Otte H., Jan Hein J. M. Ribot, and Arie L. Spaans. 2009. *Annotated Checklist of the Birds of Suriname*. World Wildlife Fund-Guianas. Paramaribo, Suriname.

Ouboter, Paul E. 2007. "Environmental Impacts of Small-and Medium-scale Gold Mining in Suriname." In *População e Meio Ambiente na Pan-Amazônia*, edited by Luis Eduardo Aragón Vaca. Editora NAEA.

PAC. 2015. *Kanuku Mountains Protected Area Management Plan 2015–2019.* Protected Areas Commission (PAC). Georgetown, Guyana.

Pacheco, Victor, Bruce D. Patterson, James L. Patton, Louise H. Emmons, Sergio Solari, and César F. Ascorra. 1993. "List of Mammal Species Known to Occur in Manu Biosphere Reserve, Peru." *Publicaciones del Museo de Historia Natural Universidad Nacional Mayor de San Marcos (A)* 44: 1–12. https://museohn.unmsm.edu.pe/docs/pub_masto/Pacheco_et_al1993_List_of_mammals_Manu.pdf.

Paemelaere, Evi A. D., Matthew T. Hallett, Kayla de Freitas, Susan Balvadore, Maxi Ignace, Allan Mandook, et al. 2024. "Medium and Large Mammal Responses to Fire in a Neotropical Savanna System in Guyana." *Biotropica* 57: 13397. http://dx.doi.org/10.1111/btp.13397.

Pereira, Cátia L., M. Thomas P. Gilbert, Miguel Bastos Araújo, and Miguel Graça Matias. 2021. "Fine-tuning Biodiversity Assessments: A Framework to Pair eDNA Metabarcoding and Morphological Approaches." *Methods in Ecology and Evolution* 12: 2397–409. https://doi.org/10.1111/2041-210X.13718.

Peres, Carlos A. 1996. "Ungulate Ectoparasite Removal by Black Caracaras and Pale-winged Trumpeters in Amazonian Forests." *Wilson Bulletin* 108(1): 170–5. https://www.jstor.org/stable/4163652.

Peres, Carlos A., and Paul M. Dolman. 2000. "Density Compensation in Neotropical Primate Communities: Evidence from 56 Hunted and Nonhunted Amazonian Forests of Varying Productivity." *Oecologia* 122: 175–89. https://doi.org/10.1007/PL00008845.

Peres, Carlos A., and Erwin Palacios. 2007. "Basin-wide Effects of Game Harvest on Vertebrate Population Densities in Amazonian Forests: Implications for Animal-mediated Seed Dispersal." *Biotropica* 39(3): 304–15. https://doi.org/10.1111/j.1744-7429.2007.00272.x.

Pickles, Rob S. A, Niall P. McCann, and Ashley P. Holland. 2011. "Mammalian and Avian Diversity of the Rewa Head, Rupununi, Southern Guyana." *Biota Neotropica* 11(3). https://doi.org/10.1590/S1676-06032011000300021.

Picq, Sophie, Amanda N. Curtis, Andrew George, Eric R. Larson, Michelle E. Thompson, Philip E. Willink, et al. 2024. "Environmental DNA Metabarcoding for Whole Community Inventories of Vertebrates in Rivers of the Midwestern United States." *Journal of Freshwater Ecology* 39: 2382454. https://doi.org/10.1080/02705060.2024.2382454.

Pierre, Meshach A., Leroy Ignacio, and Evi A.D. Paemelaere. 2020. "Large- and Medium-bodied Terrestrial Mammals of the Upper Berbice Region of Guyana." *Check List* 16(5): 1229–37. https://doi.org/10.15560/16.5.1229.

Pinkert, Stefan, Yanina V. Sica, Kevin Winner, and Walter Jetz. 2023. "The Potential of Ecoregional Range Maps for Boosting Taxonomic Coverage in Ecology and Conservation." *Ecography* 2023: e06794. https://doi.org/10.1111/ecog.06794.

Piperno, Dolores R., Crystal H. McMichael, Nigel C. A. Pitman, Juan Ernesto Guevara Andino, Marcos Ríos Paredes, Britte M. Heijink, et al. 2021. "A 5,000-year Vegetation and Fire History for Tierra Firme Forests in the Medio Putumayo-Algodón Watersheds, Northeastern Peru." *Proceedings of the National Academy of Sciences* 118 (40): e2022213118. https://doi.org/10.1073/pnas.2022213118.

Pitman, Nigel C. A., Corine F. Vriesendorp, Diana Alvira Reyes, Debra K. Moskovits, Nicholas Kotlinski, Richard C. Smith, et al. 2021. "Applied Science Facilitates the Large-scale Expansion of Protected Areas in an Amazonian Hot Spot." *Science Advances* 7(31): eabe2998. https://doi.org/10.1126/sciadv.abe2998.

Plew, Mark G. 2005. *The Archaeology of Guyana.* British Archaeological Reports.

Polak, A. Marcel. 1992. *Major Timber Trees of Guyana: A Field Guide.* The Tropenbos Foundation.

Pollock, Henry S., Judith D. Toms, Corey E. Tarwater, Thomas J. Benson, James R. Karr, and Jeffrey D. Brawn. 2022. "Long-term Monitoring Reveals Widespread and Severe Declines of Understory Birds in a Protected Neotropical Forest." *Proceedings of the National Academy of Sciences* 119: e2108731119. https://doi.org/10.1073/pnas.2108731119.

Potapov, Peter, Matthew C. Hansen, Lars Laestadius, Svetlana Turubanova, Alexey Yaroshenko, Christoph Thies, et al. 2017. "The Last Frontiers of Wilderness: Tracking Loss of Intact Forest Landscapes from 2000 to 2013." *Science Advances* 3: e1600821. https://www.science.org/doi/pdf/10.1126/sciadv.1600821.

Potapov, Peter, Aleksey Yaroshenko, Svetlana Turubanova, Maxim Dubinin, Lars Laestadius, Christoph Thies, et al. 2008. "Mapping the World's Intact Forest Landscapes by Remote Sensing." *Ecology and Society* 13(2): 51. http://www.ecologyandsociety.org/vol13/iss2/art51/.

Prado, Helbert M., and Rui S.S. Murrieta. 2015. "Ethnoecology in Perspective: The Origins, Interfaces and Current Trends of a Growing Field." *Ambiente & Sociedade* 18(4): 133–54. https://doi.org/10.1590/1809-4422ASOC986V1842015.

Prugh, Laura R., and Christopher D. Golden. 2014. "Does Moonlight Increase Predation Risk? Meta-analysis Reveals Divergent Responses of Nocturnal Mammals to Lunar Cycles." *Journal of Animal Ecology* 83(2): 504–14. https://doi.org/10.1111/1365-2656.12148.

Raemy, Matthieu, and Sylvain Ursenbacher. 2018. "Detection of the European Pond Turtle (*Emys orbicularis*) by Environmental DNA: Is eDNA Adequate for Reptiles?" *Amphibia-Reptilia* 39(2): 135–43. https://doi.org/10.1163/15685381-17000025.

Rapid Assessment Program. 2008. *Biodiversity in the Konashen Community-Owned Conservation Area, Guyana.* Conservation International. https://www.conservation.org/docs/default-source/publication-pdfs/ci_konashen_coca_biodiversity_booklet.pdf?Status=Master&sfvrsn=39394a3e_3.

Riaz, Tiayyba, Wasim Shehzad, Alain Viari, François Pompanon, Pierre Taberlet, and Eric Coissac. 2011. "EcoPrimers: Inference of New DNA Barcode Markers from Whole Genome Sequence Analysis." *Nucleic Acids Research* 39: e145. https://doi.org/10.1093/nar/gkr732.

Rivière, Peter. 1969. *Marriage Among the Trio*. Clarendon Press.

Rivière, Peter, ed. 2006a. *The Guiana Travels of Robert Schomburgk 1835–1844, Vol. I: Explorations on Behalf of the Royal Geographic Society 1835–1839*. The Hakluyt Society.

Rivière, Peter, ed. 2006b. *The Guiana Travels of Robert Schomburgk 1835–1844, Vol. II: The Boundary Survey 1840–1844*. The Hakluyt Society.

Robbins, Mark B., Michael J. Braun, Christopher M. Milensky, Brian K. Schmidt, Waldyke Prince, Nathan H. Rice, et al. 2007. "Avifauna of the Upper Essequibo River and Acary Mountains, Southern Guyana." *Ornitologia Neotropical* 18: 339–68. https://repository.si.edu/bitstream/handle/10088/7474/bks3.pdf.

Roe, Peter G. 1990. "The Language of Plumes: 'Implicit Mythology' in Shipibo, Cashinahua, and Waiwai Feather Adornments." In *LAIL Speaks!: Selected Papers from the VII International Symposium on Latin American Literature*, edited by Mary H. Preuss. Labyrinthos.

Rohland, N., and D. Reich. 2012. "Cost-effective, High-throughput DNA Sequencing Libraries for Multiplexed Target Capture." *Genome Research* 22: 939–46. http://www.genome.org/cgi/doi/10.1101/gr.128124.111.

Rosas, Fernando C. W., Janson A. S. Zuanon, and Sarah K. Carter. 1999. "Feeding Ecology of the Giant Otter, *Pteronura brasiliensis*." *Biotropica* 31(3): 502–6. https://doi.org/10.1111/j.1744-7429.1999.tb00393.x.

Rosas-Ribeiro, Patrícia F., Fernando C. W. Rosas, and Janson Zuanon. 2012. "Conflict between Fishermen and Giant Otters *Pteronura brasiliensis* in Western Brazilian Amazon." *Biotropica* 44(3): 437–44. https://doi.org/10.1111/j.1744-7429.2011.00828.x.

Rossi, Rogério Vieira, Richard Bodmer, José Mauricio Barbanti Duarte, and Roberto Guilherme Trovati. 2010. "Amazonian Brown Brocket Deer *Mazama nemorivaga* (Cuvier 1817)." *Neotropical Cervidology: Biology and Medicine of Latin American Deer*, edited by José Mauricio Barbanti Duarte and Susana González. Fundação de Apoio a Pesquisa, Ensino e Extensão (FUNEP) and International Union for the Conservation of Nature (IUCN).

Rovero, Francesco, and Jorge Ahumada. 2017. "The Tropical Ecology, Assessment and Monitoring (TEAM) Network: An Early Warning System for Tropical Rain Forests." *Science of the Total Environment* 574: 914–23. https://doi.org/10.1016/j.scitotenv.2016.09.146.

Rowe, D.L. and R.L. Honeycutt. 2002. "Phylogenetic Relationships, Ecological Correlates, and Molecular Evolution within the Cavioidea (Mammalia, Rodentia)." *Molecular Biology and Evolution* 19(3): 263–77. https://doi.org/10.1093/oxfordjournals.molbev.a004080.

Rutt, Cameron L., Karl Mokross, Michael D. Kaller, and Philip C. Stouffer. 2020. "Experimental Forest Fragmentation Alters Amazonian Mixed-species Flocks." *Biological Conservation* 242: 108415. https://doi.org/10.1016/j.biocon.2020.108415.

Rutt, Cameron L. and Philip C. Stouffer. 2021. "Seasonal Dynamics of Flock Interaction Networks Across a Human-modified Landscape in Lowland Amazonian Rain Forest." *Ecological Applications* 31: e02235. https://doi.org/10.1002/eap.2235.

Sanderson, James G., Eustace Alexander, Vitus Antone, and Charakura Yukuma. 2008. "Non-Volant Mammals of the Konashen COCA, Southern Guyana." In *A Rapid Biological Assessment of the Konashen Community Owned Conservation Area, Southern Guyana*, edited by Leeanne E. Alonso, Jennifer McCullough, Piotr Naskrecki, and Eustace Alexander. RAP Bulletin of Biological Assessment 51. Conservation International. https://doi.org/10.1896/054.051.0113.

Schomburgk, Robert H. 1840. *Report of the Third Expedition into the Interior of Guayana, Comprising the Journey to the Sources of the Essequibo, to the Carumá Mountains, and to Fort San Joaquim, on the Rio Branco, in 1837–8*. The Journal of the Royal Geographical Society of London.

Schuler Zea, Evelyn. 2018. "Waiwai." Povos Indígenas No Brasil. Instituto Socioambiental. https://pib.socioambiental.org/en/Povo:Waiwai.

Schwarz, Herbert F. 1940. "Additional Species and Records of Stingless Bees (Meliponidae) from British Guiana: Based on Specimens Collected by the Terry-Holden Expedition." *American Museum Novitates* 1078: 1–12. http://hdl.handle.net/2246/2236.

Secretaria de Estado de Meio Ambiente do Pará. 2011a. *Plano de Manejo da Estação Ecológica do Grão-Pará*. Belém. https://ideflorbio.pa.gov.br/estacao-ecologica-do-grao-para/.

Secretaria de Estado de Meio Ambiente do Pará. 2011b. *Anexo 1 do Plano de Manejo da Estação Ecológica do Grão-Pará: Diagnóstico da Biodiversidade das Unidades de Conservação Estaduais do Mosaico Calha Norte, Estado do Pará*. Belém. https://drive.google.com/file/d/1c4O0S914XATFbWTnO0_rU_MBRrMqgc2w/view.

Secretaria de Estado de Meio Ambiente do Pará. 2011c. *Anexo 2 do Plano de Manejo da Estação Ecológica do Grão-Pará: Ocorrência de Espécies na Estação Ecológica Grão-Pará*. Belém. https://drive.google.com/file/d/1c4O0S914XATFbWTnO0_rU_MBRrMqgc2w/view.

Secretaria de Estado de Meio Ambiente do Pará, and Imazon. 2013. *Pará State Conservation Units in the Region of Calha Norte of the Amazon River*. SEMA and Instituto do Homem e Meio Ambiente da Amazônia. Belém. https://imazon.org.br/en/publicacoes/para-state-conservation-units-in-the-region-of-calha-norte-of-the-amazon-river/.

Señaris, J. Celsa, Carlos A. Lasso, Gilson Rivas, Michelle Kalamandeen, and Elisha Marawanaru. 2008. "Amphibians and Reptiles of the Acarai Mountains, and Sipu, Kamoa and Essequibo Rivers in the Konashen Community Owned Conservation Area, Guyana." In *A Rapid Biological Assessment of the Konashen Community Owned Conservation Area, Southern Guyana*, edited by Leeanne E. Alonso, Jennifer McCullough, Piotr Naskrecki, and Eustace Alexander. RAP Bulletin of Biological Assessment 51. Conservation International. https://doi.org/10.1896/054.051.0111.

Shaffer, Christopher A., Marissa S. Milstein, Charakura Yukuma, Elisha Marawanaru, and Philip Suse. 2017. "Sustainability and Comanagement of Subsistence Hunting in an Indigenous Reserve in Guyana." *Conservation Biology* 31(5): 1119–31. https://doi.org/10.1111/cobi.12891.

Shaffer, Christopher A., Charakura Yukuma, Elisha Marawanaru, and Philip Suse. 2018a. "Assessing the Sustainability of Waiwai Subsistence Hunting in Guyana by Comparison of Static Indices and Spatially Explicit, Biodemographic Models." *Animal Conservation* 21(2): 148–58. https://doi.org/10.1111/acv.12366.

Shaffer, Christopher A., Marissa S. Milstein, Philip Suse, Elisha Marawanaru, Charakura Yukuma, Tiffany M. Wolf, et al. 2018b. "Integrating Ethnography and Hunting Sustainability Modeling for Primate Conservation in an Indigenous Reserve in Guyana." *International Journal of Primatology* 39: 945–68. https://doi.org/10.1007/s10764-018-0066-2.

Shepard, Glenn H., and Henri Ramirez. 2011. "'Made in Brazil': Human Dispersal of the Brazil Nut (*Bertholletia excelsa*, Lecythidaceae) in Ancient Amazonia." *Economic Botany* 65: 44–65. https://doi.org/10.1007/s12231-011-9151-6.

Simon, George. 2007. *Pre-Excavation Exploration of Conservation International Protected Area on the Upper Essequibo River.* Conservation International Foundation (Guyana) Inc. Georgetown, Guyana.

Smith, A. C. 1939. "Plant Collecting in Guyana." *Journal of the New York Botanical Garden* XL(469): 10–21.

Smith, H. Carrington. 1940. "On the frontier of British Guiana and Brazil." In *The Smithsonian Report for 1939.* United States Government Printing Office Publication 3569. Washington, D.C. https://ufdc.ufl.edu/uf00078353/00001.

Spaans, Arie L., Otte H. Ottema, and Jan Hein J. M. Ribot. 2016. *Field Guide to the Birds of Suriname*. Koninklijke Brill NV.

Spear, Stephen J., John D. Groves, Lori A. Williams, and Lisette P. Waits. 2015. "Using Environmental DNA Methods to Improve Detectability in a Hellbender (*Cryptobranchus alleganiensis*) Monitoring Program." *Biological Conservation* 183: 38–45. https://doi.org/10.1016/j.biocon.2014.11.016.

SRDC. 2012. *Baokopa'o wa di'itinpan wadaun nii nao ati: Kaimanamana'o, wa zaamatapan, wa di'itapan na'apamnii wa sha'apatan Wapichan wiizi Guyana'ao raza. (Thinking together for those coming behind us: An outline plan for the care of Wapichan territory in Guyana).* Report of the South Central and South Rupununi Districts Toshaos Councils. South Rupununi District Council (SRDC). South Rupununi, Region 9, Guyana. https://www.scribd.com/document/354296086/Wapichan-Territorial-Plan-2012?secret_password=Bnj1xSAbnIF7RvGh5eqA.

SRDC. 2018. Wapichan environmental monitoring report. Unpublished September 2018 report prepared by the South Rupununi District Council (SRDC) and presented to President David Grainger. http://wapichanao.communitylands.org/1548691773093-wapichan-environmental-monitoring-report-2018-v2.pdf.

Stabroek News. 2014. "GDF educating Cashew Island pupils." *Stabroek News*, August 4. https://www.stabroeknews.com/2014/08/04/news/guyana/gdf-educating-cashew-island-pupils/.

Stallard, Robert F. 1985. "River Chemistry, Geology, Geomorphology, and Soils in the Amazon and Orinoco Basins." In *The Chemistry of Weathering*, edited by James Irving Drever. D. Reidel Publishing Co.

Stallard, Robert F. 1988. "Weathering and Erosion in the Humid Tropics." In *Physical and Chemical Weathering in Geochemical Cycles*, edited by Abraham Lerman and Michel Meybeck. Kluwer Academic Publishers.

Stallard, Robert F. 2005. "Landscape Processes: Geology, Hydrology, and Soils." In *Perú: Matsés*, edited by Corine Vriesendorp, Nigel Pitman, José Ignacio Rojas Moscoso, Lelis Rivera Chávez, Luis Calixto Méndez, Manuel Vela Collantes, et al. The Field Museum.

Stallard, Robert F. 2006. "Geology and Hydrology." In *Perú: Sierra del Divisor*, edited by Corine Vriesendorp, Thomas S. Schulenberg, Debra K. Moskovits and José-Ignacio Rojas Moscoso. The Field Museum.

Stallard, Robert F. 2007. "Geology, Hydrology, and Soils." In *Perú: Nanay-Mazán-Arabela*, edited by Corine Vriesendorp, José A. Álvarez, Nélida Barbagelata, William S. Alverson, and Debra K. Moskovits. The Field Museum.

Stallard, Robert F. 2011. "Landscape Processes: Geology, Hydrology, and Soils." In *Perú: Yaguas-Cotuhé*, edited by Nigel Pitman, Corine Vriesendorp, Debra K. Moskovits, Rudolph von May, Diana Alvira, Tyana Wachter, et al. The Field Museum.

Stallard, Robert F. 2013. "Geology, Hydrology, and Soils." In *Perú: Ere-Campuya-Algodón*, edited by Nigel Pitman, Ernesto Ruelas Inzunza, Corine Vriesendorp, Douglas F. Stotz, Tyana Wachter, Álvaro del Campo, et al. The Field Museum.

Stallard, Robert F., Jennifer Ángel Amaya, Pedro Botero, and Javier Salas. 2021. "Geology, Soils and Water." In *Colombia, Peru: Bajo Putumayo-Yaguas-Cotuhé*, edited by Christopher C. Jarrett, Michelle E. Thompson, Nigel Pitman, Corine F. Vriesendorp, Diana Alvira Reyes, Ana A. Lemos, et al. The Field Museum.

Stallard, Robert F., and Trey D. Crouch. 2015. "Geology, Hydrology, and Soils." In *Perú: Tapiche-Blanco*, edited by Nigel Pitman, Corine Vriesendorp, Lelis Rivera Chávez, Tyana Wachter, Diana Alvira Reyes, Álvaro del Campo, et al. The Field Museum.

Stallard, Robert F., and Edmond, J. M., 1983. "Geochemistry of the Amazon 2: The Influence of the Geology and Weathering Environment on the Dissolved Load." *Journal of Geophysical Research-Oceans and Atmospheres* 88(NC14): 9671–88, microfiche supplement. https://doi.org/10.1029/JC088iC14p09671.

Stallard, Robert F., and Lina Lindell. 2014. "Geology, Hydrology, and Soils." In *Perú: Cordillera Escalera-Loreto*, edited by Nigel Pitman, Corine Vriesendorp, Diana Alvira, Jonathan A. Markel, Mark Johnston, Ernesto Ruelas Inzunza, et al. The Field Museum.

Stallard, Robert F., and Sandra C. Londoño. 2016. "Geology, Hydrology, and Soils." In *Perú: Medio Putumayo-Algodón*, edited by Nigel Pitman, Adriana Bravo, Santiago Claramunt, Corine Vriesendorp, Diana Alvira Reyes, Ashwin Ravikumar, et al. The Field Museum.

Stallard, Robert F., and Vladimir Zapata-Pardo. 2012. "Geology, Hydrology, and Soils." In *Perú: Cerros de Kampankis*, edited by Nigel Pitman, Ernesto Ruelas Inzunza, Diana Alvira, Corine Vriesendorp, Debra K. Moskovits, Álvaro del Campo, et al. The Field Museum.

Stone, S., A. Demetro, M. Gomes, C. Bernard, and Community Members of Masakenari. 2010. "Managing Traditional Lands for Conservation and Development: The Wai Wai in Southern Guyana." In Indigenous Peoples and Conservation: From Rights to Resource Management, edited by Kristen Painemilla, Anthony Rylands, Alisa Woofter, and Cassie Hughes. Conservation International.

Stotz, Douglas F., and Richard O. Bierregaard, Jr. 1989. "The Birds of the Fazendas Porto Alegre, Esteio and Dimona North of Manaus, Amazonas, Brazil." *Revista Brasileira de Biologia* 49: 861–72.

Stotz, Douglas F., and Ernesto Ruelas Inzunza. 2013. "Birds." In *Perú: Ere-Campuya-Algodón*, edited by Nigel Pitman, Ernesto Ruelas Inzunza, Corine Vriesendorp, Douglas F. Stotz, Tyana Wachter, Álvaro del Campo, et al. The Field Museum.

Stouffer, Philip C. 2007. "Density, Territory Size, and Long-Term Spatial Dynamics of a Guild of Terrestrial Insectivorous Birds near Manaus, Brazil." *The Auk* 124: 291–306. https://doi.org/10.1093/auk/124.1.291.

Stouffer, Philip C., Vitek Jirinec, Cameron L. Rutt, Richard O. Bierregaard, Jr., Angélica Hernández-Palma, Erik I. Johnson, et al. 2021. "Long-term Change in the Avifauna of Undisturbed Amazonian Rainforest: Ground-foraging Birds Disappear and the Baseline Shifts." *Ecology Letters* 24: 186–95. https://doi.org/10.1111/ele.13628.

Stouffer, Philip C., Erik I. Johnson, and Richard O. Bierregaard, Jr. 2013. "Breeding Seasonality in Central Amazonian Rainforest Birds." *The Auk* 130: 529–40. https://doi.org/10.1525/auk.2013.12179.

Tanwar, Kamakshi S., Ayan Sadhu, and Yadvendradev V. Jhala. 2021. "Camera Trap Placement for Evaluating Species Richness, Abundance, and Activity." *Scientific Reports* 11(1): 23050. https://doi.org/10.1038/s41598-021-02459-w.

Taphorn, Donald C., and Matthew Kolmann. 2016. "A Rapid Biodiversity Survey of the Fishes of the South Rupununi Savannah Area, Guyana." In *Biodiversity Assessment Survey of the South Rupununi Savannah, Guyana*, edited by Leeanne E. Alonso, Juliana Persaud, and Aiesha Williams. BAT Survey Report No. 1. World Wildlife Fund-Guianas. Georgetown, Guyana.

Taphorn, Donald C., Elford Liverpool, Nathan K. Lujan, Carlos DoNascimiento, Devya D. Hemraj, William G.R. Crampton, et al. 2022. "Annotated Checklist of the Primarily Freshwater Fishes of Guyana." *Proceedings of the Academy of Natural Sciences of Philadelphia* 168(1): 1–95. https://doi.org/10.1635/053.168.0101.

Terborgh, John, Lawrence Lopez, Percy Nuñez, Madhu Rao, Ghazala Shahabuddin, Gabriela Orihuela, et al. 2001. "Ecological Meltdown in Predator-free Forest Fragments." *Science* 294(5548): 1923–6. https://doi.org/10.1126/science.1064397.

ter Steege, Hans. 1998. "The Use of Forest Inventory Data for a National Protected Area Strategy in Guyana." *Biodiversity and Conservation* 7: 1457–83. https://doi.org/10.1023/A:1008893920157.

ter Steege, Hans. 2000. *Plant Diversity in Guyana: With Recommendations for a Protected Areas Strategy.* Tropenbos Series 18. https://www.tropenbos.org/resources/publications/plant+diversity+in+guyana:+with+recommendations+for+a+protected+areas+strategy.

ter Steege, Hans. 2001. *Mapping Forest and Vegetation of Guyana at Regional and National Level.* Consultancy report prepared for Guyana Forestry Commission (including 1:1,000,000 vegetation map of Guyana and 1:250,000 digital vegetation maps of State Forest Lands). Guyana Forestry Commission. Georgetown, Guyana.

ter Steege, Hans, Edwin Pos, Stephanie Ijff, and Godfrey Scott. 2014. *Plant Diversity of the Konashen Area of Guyana: Preliminary Report of the Nov–Dec 2013 Expedition*. Unpublished report courtesy of the first author.

ter Steege, Hans, Nigel C.A. Pitman, Iêda Leão do Amaral, Luiz de Souza Coelho, Francisca Dionízia de Almeida Matos, Diógenes de Andrade Lima Filho, et al. 2023. "Mapping Density, Diversity and Species-richness of the Amazon Tree Flora." *Communications Biology* 6: 1130. https://doi.org/10.1038/s42003-023-05514-6.

ter Welle, B.J.H., Marian J. Jacob-Jensens, and P.P. Haripersaud. 2000. *Botanical exploration in Guyana, Corona Falls (Rewa River) towards Essequibo River, August 19–October 13, 1999*. Unpublished report from the University of Utrecht Herbarium, in cooperation with University of Guyana, National Herbarium, and Guyana Forestry Commission. Courtesy of the second author.

The Official Gazette of Guyana. 2019. *Wildlife Conservation and Management Act*. Wildlife Conservation, Management and Sustainable Use Regulations. The Official Gazette. February 9, 2019. https://wildlife.gov.gy/wp-content/uploads/2019/08/Wildlife-Conservation-Management-Sustainable-Use-Regulations.pdf.

Thiagavel, Jeneni, Sharlene E. Santana, and John M. Ratcliffe. 2017. "Body Size Predicts Echolocation Call Peak Frequency Better than Gape Height in Vespertilionid Bats." *Scientific Reports* 7: 828. https://www.nature.com/articles/s41598-017-00959-2.

Thomas, Michael, Timothy Williams, L. McKenna, Brian O'Shea, and Nathalie van Vliet, eds. 2023. *The Karaawaimin Taawa: Insights from a Biocultural Assessment led by the Wapichan People in Guyana*. Sustainable Wildlife Management Program, Food and Agriculture Organization of the United Nations (FAO), French Agricultural Research Centre for International Development (CIRAD), Center for International Forestry Research (CIFOR) and Wildlife Conservation Society (WCS). https://www.fao.org/documents/card/en/c/cc5251en.

Tostain, Olivier, Jean-Luc Dujardin, Christian Érard, and Jean-Marc Thiollay. 1992. *Oiseaux de Guyane: Biologie, Écologie, Protection, Répartition*. Société d'Etudes Ornithologiques and Laboratoire d'Ecologie Générale, Muséum National d'Histoire Naturelle.

Trotz, Maya. 2008. "Water Quality at Selected Sites in the Konashen Community Owned Conservation Area, Southern Guyana." In *A Rapid Biological Assessment of the Konashen Community Owned Conservation Area, Southern Guyana*, edited by Leeanne E. Alonso, Jennifer McCullough, Piotr Naskrecki, and Eustace Alexander. RAP Bulletin of Biological Assessment 51. Conservation International. https://doi.org/10.1896/054.051.0109.

Umetsu, Fabiana, Laura Naxara, and Renata Pardini. 2006. "Evaluating the Efficiency of Pitfall Traps for Sampling Small Mammals in the Neotropics." *Journal of Mammalogy* 87(4): 757–65. https://doi.org/10.1644/05-MAMM-A-285R2.1.

UNEP-WCMC and IUCN. 2025. Protected Planet: The World Database on Protected Areas (WDPA)/The World Database on Other Effective Area-based Conservation Measures (WD-OECM). United Nations Environment Program (UNEP) - World Conservation Monitoring Center (WCMC) and International Union for the Conservation of Nature (IUCN). Cambridge, UK. www.protectedplanet.net.

UNEP. 2024. The Species+ Website. Compiled by United Nations Environment Program (UNEP) - World Conservation Monitoring Center (WCMC). Cambridge, UK. www.speciesplus.net.

Vacher, Jean Pierre, Jérôme Chave, Francesco Gentile Ficetola, Guilhem Sommeria⊠Klein, Shengli Tao, Christophe Thébaud, et al. 2020. "Large-scale DNA-based Survey of Frogs in Amazonia Suggests a Vast Underestimation of Species Richness and Endemism." *Journal of Biogeography* 47(8): 1781–91. https://doi.org/10.1111/jbi.13847.

Vacher, Jean Pierre, Philippe J.R. Kok, Miguel Trefaut Rodrigues, Albertina Lima, Tomas Hrbek, Fernanda P. Werneck, et al. 2024. "Diversification of the Terrestrial Frog Genus *Anomaloglossus* (Anura, Aromobatidae) in the Guiana Shield Proceeded from Highlands to Lowlands, With Successive Loss and Reacquisition of Endotrophy." *Molecular Phylogenetics and Evolution* 192: 108008. https://doi.org/10.1016/j.ympev.2023.108008.

Valentino, Leonor. 2019. "As Transformações da Pessoa Entre os Katwena e os Tunayana dos Rios Mapuera e Trombetas." PhD diss., Federal University of Rio de Janeiro.

van Andel, Tinde R. 2003. "Floristic Composition and Diversity of Three Swamp Forests in Northwest Guyana." *Plant Ecology* 167: 293–317. https://doi.org/10.1023/A:1023935326706.

van Dam, J.A.C. 2002. "The Guyanan Plant Collections of Robert and Richard Schomburgk." In *Flora of the Guianas, Supplementary Series, Fasc. 3*, edited by Marian J. Jansen-Jacobs. Royal Botanic Gardens, Kew.

Vari, Richard P. and Carlos J. Ferraris, Jr. 2009. "Fishes of the Guiana Shield." *Bulletin of the Biological Society of Washington* 17(1): 8–18. https://doi.org/10.2988/0097-0298-17.1.8.

Vickers, William T. 1991. "Hunting Yields and Game Composition over Ten Years in an Amazon Indian Territory." In *Neotropical Wildlife Use and Conservation*, edited by John G. Robinson and Kent H. Redford. University of Chicago Press.

Voss, Robert S., Darrin P. Lunde, and Nancy B. Simmons. 2001. "The Mammals of Paracou, French Guiana: A Neotropical Lowland Rainforest Fauna, Part 2. Nonvolant Species." *Bulletin of the American Museum of Natural History* 263: 3–236. https://doi.org/10.1206/0003-0090(2001)263%3C0003:TMOPFG%3E2.0.CO;2.

Voss, Robert S., and Sharon A. Jansa. 2009. "Phylogenetic Relationships and Classification of Didelphid Marsupials, an Extant Radiation of New World Metatherian Mammals." *Bulletin of the American Museum of Natural History* 322: 1–177. https://doi.org/10.1206/322.1.

Wali, Alaka, Diana Alvira, Paula S. Tallman, Ashwin Ravikumar, and Miguel O. Macedo. 2017. "A New Approach to Conservation: Using Community Empowerment for Sustainable Well-being." *Ecology and Society* 22(4): 6. https://doi.org/10.5751/ES-09598-220406.

Watson, James E. M., Tom Evans, Oscar Venter, Brooke Williams, Ayesha Tulloch, Claire Stewart, et al. 2018. "The Exceptional Value of Intact Forest Ecosystems." *Nature Ecology and Evolution* 2: 599–610. https://doi.org/10.1038/s41559-018-0490-x.

Weksler, Marcelo, Alexandre Reis Percequillo, and Robert S. Voss. 2006. "Ten New Genera of Oryzomyine Rodents (Cricetidae: Sigmodontinae)." *American Museum Novitates* 3537: 1–29. https://doi.org/10.1206/0003-0082(2006)3537[1:TNGOOR]2.0.CO;2.

Werkhoven, Margaretha C.M., and Geert M.T. Peeters. 1993. "Aquatic Macrophytes." In *Freshwater Ecosystems of Suriname*, edited by Paul Ouboter. Kluwer.

Wetterer, Andrea L., Matthew V. Rockman, and Nancy B. Simmons. 2000. "Phylogeny of Phyllostomid Bats (Mammalia: Chiroptera): Data from Diverse Morphological Systems, Sex Chromosomes, and Restriction Sites." *Bulletin of the American Museum of Natural History* 248: 1–200. https://doi.org/10.1206/0003-0090(2000)248%3C0001:POPBMC%3E2.0.CO;2.

Whitehead, Neil, Michael G. Heckenberger, and George Simon. 2010. "Materializing the Past among the Lokono (Arawak) of the Berbice River, Guyana." *Antropológica* 114: 87–127. https://biblat.unam.mx/hevila/AntropologicaCaracas/2010/vol54/no114/5.pdf.

Whittaker, Andrew. 1994. "The Rediscovery of Pelzeln's Tody-tyrant *Hemitriccus inornatus* after 161 Years!" *Cotinga* 2: 10. https://www.neotropicalbirdclub.org/wp-content/uploads/2016/05/Neotropical-News-1-19.pdf.

Williams, D. 1979a. "Preceramic Fishtraps on the Upper Essequibo: Report on a Survey of Unusual Petroglyphs on the Upper Essequibo and Kassikaityu Rivers." *Journal of Archaeology and Anthropology* 2(2): 125–40.

Williams, D. 1979b. "Controlled Resource Exploitation in Contrasting Neotropical Environments Evidenced by Meso-Indian Petroglyphs in Southern Guyana." *Journal of Archeology and Anthropology* 2(2): 141–8.

Willink, Philip W., Eustace Alexander, and Christopher C. Jones. 2013. "Using Fish Assemblages in Different Habitats to Develop a Management Plan for the Upper Essequibo Conservation Concession, Guyana." *Biota Neotropica* 13(4): 260–8. https://doi.org/10.1590/S1676-06032013000400023.

Wilkie, David S., Michelle Wieland, and John R. Poulsen. 2019. "Unsustainable vs. Sustainable Hunting for Food in Gabon: Modeling Short- and Long-term Gains and Losses." *Frontiers in Ecology and Evolution* 7: 357. https://doi.org/10.3389/fevo.2019.00357.

Wozencraft, W.C. 1993. "Order Carnivora, Family Mustelidae." In *Mammal Species of the World: A Taxonomic and Geographic Reference*, edited by Don E. Wilson and DeeAnn M. Reeder. Smithsonian Institution Press.

Yde, Jens. 1965. *Material Culture of the Waiwái.* The National Museum of Copenhagen.

Yoh, Natalie, Peter Syme, Ricardo Rocha, Christoph F.J. Meyer, and Adrià López-Baucells. 2020. "Echolocation of Central Amazonian 'Whispering' Phyllostomid Bats: Call Design and Interspecific Variation." *Mammal Research* 65(3): 583–97. https://doi.org/10.1007/s13364-020-00503-0.

Zhang, Shan, Jingdong Zhao, and Meng Yao. 2023. "Urban Landscape-Level Biodiversity Assessments of Aquatic and Terrestrial Vertebrates by Environmental Dna Metabarcoding." *Journal of Environmental Management* 340: 117971. https://doi.org/10.1016/j.jenvman.2023.117971.

Zyskowski, Kristof, John C. Mittermeier, Otte Ottema, Marko Rakovic, Brian J.O'Shea, Jonas E. Lai, et al. 2011. "Avifauna of the Easternmost Tepui, Tafelberg in Central Suriname." *Bulletin of the Peabody Museum of Natural History* 52: 153–80. https://doi.org/10.3374/014.052.0105.

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Plate 4 (Campsites): Figs. 4A–C, Esteban Barrera; Fig. 4D, Lesley de Souza

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Plate 8 (Reptiles and Amphibians): Figs. 8A–G, 8K–N, 8Q, 8S, Antoine Fouquet; Figs. 8H–G, Esteban Barrera; Figs. 8P, 8R, Cameron Rutt

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PUBLISHED REPORTS

Alverson, W. S., D.K. Moskovits and J.M. Shopland, eds. 2000. Bolivia: Pando, Río Tahuamanu. Rapid Biological Inventories Report 01. The Field Museum, Chicago.

Alverson, W. S., L.O. Rodríguez and D.K. Moskovits, eds. 2001. Perú: Biabo Cordillera Azul. Rapid Biological Inventories Report 02. The Field Museum, Chicago.

Pitman, N., D.K. Moskovits, W.S. Alverson and R. Borman A., eds. 2002. Ecuador: Serranías Cofán-Bermejo, Sinangoe. Rapid Biological Inventories Report 03. The Field Museum, Chicago.

Stotz, D.F., E.J. Harris, D.K. Moskovits, K. Hao, S.Yi, and G.W. Adelmann, eds. 2003. China: Yunnan, Southern Gaoligongshan. Rapid Biological Inventories Report 04. The Field Museum, Chicago.

Alverson, W.S., ed. 2003. Bolivia: Pando, Madre de Dios. Rapid Biological Inventories Report 05. The Field Museum, Chicago.

Alverson, W.S., D.K. Moskovits and I.C. Halm, eds. 2003. Bolivia: Pando, Federico Román. Rapid Biological Inventories Report 06. The Field Museum, Chicago.

Kirkconnell P., A., D.F. Stotz and J.M. Shopland, eds. 2005. Cuba: Península de Zapata. Rapid Biological Inventories Report 07. The Field Museum, Chicago.

Díaz, L.M., W.S. Alverson, A. Barreto V. and T. Wachter, eds. 2006. Cuba: Camagüey, Sierra de Cubitas. Rapid Biological Inventories Report 08. The Field Museum, Chicago.

Maceira F., D., A. Fong G. and W.S. Alverson, eds. 2006. Cuba: Pico Mogote. Rapid Biological Inventories Report 09. The Field Museum, Chicago.

Fong G., A., D. Maceira F., W.S. Alverson and J.M. Shopland, eds. 2005. Cuba: Siboney-Juticí. Rapid Biological Inventories Report 10. The Field Museum, Chicago.

Pitman, N., C. Vriesendorp and D. Moskovits, eds. 2003. Perú: Yavarí. Rapid Biological Inventories Report 11. The Field Museum, Chicago.

Pitman, N., R.C. Smith, C. Vriesendorp, D. Moskovits, R. Piana, G. Knell and T. Wachter, eds. 2004. Perú: Ampiyacu, Apayacu, Yaguas, Medio Putumayo. Rapid Biological Inventories Report 12. The Field Museum, Chicago.

Maceira F., D., A. Fong G., W.S. Alverson and T. Wachter, eds. 2005. Cuba: Parque Nacional La Bayamesa. Rapid Biological Inventories Report 13. The Field Museum, Chicago.

Fong G., A., D. Maceira F., W.S. Alverson and T. Wachter, eds. 2005. Cuba: Parque Nacional "Alejandro de Humboldt." Rapid Biological Inventories Report 14. The Field Museum, Chicago.

Vriesendorp, C., L. Rivera Chávez, D. Moskovits and J. Shopland, eds. 2004. Perú: Megantoni. Rapid Biological Inventories Report 15. The Field Museum, Chicago.

Vriesendorp, C., N. Pitman, J.I. Rojas M., B.A. Pawlak, L. Rivera C., L. Calixto M., M. Vela C. and P. Fasabi R., eds. 2006. Perú: Matsés. Rapid Biological Inventories Report 16. The Field Museum, Chicago.

Vriesendorp, C., T.S. Schulenberg, W.S. Alverson, D.K. Moskovits and J.-I. Rojas Moscoso, eds. 2006. Perú: Sierra del Divisor. Rapid Biological Inventories Report 17. The Field Museum, Chicago.

Vriesendorp, C., J.A. Álvarez, N. Barbagelata, W.S. Alverson and D.K. Moskovits, eds. 2007. Perú: Nanay-Mazán-Arabela. Rapid Biological Inventories Report 18. The Field Museum, Chicago.

Borman, R., C. Vriesendorp, W.S. Alverson, D.K. Moskovits, D.F. Stotz and Á. del Campo, eds. 2007. Ecuador: Territorio Cofan Dureno. Rapid Biological Inventories Report 19. The Field Museum, Chicago.

Alverson, W.S., C. Vriesendorp, Á. del Campo, D.K. Moskovits, D.F. Stotz, Miryan García Donayre and Luis A. Borbor L., eds. 2008. Ecuador, Perú: Cuyabeno-Güeppí. Rapid Biological and Social Inventories Report 20. The Field Museum, Chicago.

Vriesendorp, C., W. S. Alverson, Á. del Campo, D. F. Stotz, D. K. Moskovits, S. Fuentes C., B. Coronel T. and E. P. Anderson, eds. 2009. Ecuador: Cabeceras Cofanes-Chingual. Rapid Biological and Social Inventories Report 21. The Field Museum, Chicago.

Gilmore, M.P., C. Vriesendorp, W.S. Alverson, Á. del Campo, R. von May, C. López Wong and S. Ríos Ochoa, eds. 2010. Perú: Maijuna. Rapid Biological and Social Inventories Report 22. The Field Museum, Chicago.

Pitman, N., C. Vriesendorp, D.K. Moskovits, R. von May, D. Alvira, T. Wachter, D.F. Stotz and Á. del Campo, eds. 2011. Perú: Yaguas-Cotuhé. Rapid Biological and Social Inventories Report 23. The Field Museum, Chicago.

Pitman, N., E. Ruelas I., D. Alvira, C. Vriesendorp, D.K. Moskovits, Á. del Campo, T. Wachter, D.F. Stotz, S. Noningo S., E. Tuesta C. and R.C. Smith, eds. 2012. Perú: Cerros de Kampankis. Rapid Biological and Social Inventories Report 24. The Field Museum, Chicago.

Pitman, N., E. Ruelas Inzunza, C. Vriesendorp, D.F. Stotz, T. Wachter, Á. del Campo, D. Alvira, B. Rodríguez Grández, R.C. Smith, A.R. Sáenz Rodríguez and P. Soria Ruiz, eds. 2013. Perú: Ere-Campuya-Algodón. Rapid Biological and Social Inventories Report 25. The Field Museum, Chicago.

Pitman, N., C. Vriesendorp, D. Alvira, J.A. Markel, M. Johnston, E. Ruelas Inzunza, A. Lancha Pizango, G. Sarmiento Valenzuela, P. Álvarez-Loayza, J. Homan, T. Wachter, Á. del Campo, D. F. Stotz and S. Heilpern, eds. 2014. Perú: Cordillera Escalera-Loreto. Rapid Biological and Social Inventories Report 26. The Field Museum, Chicago.

Pitman, N., C. Vriesendorp, L. Rivera Chávez, T. Wachter, D. Alvira Reyes, Á. del Campo, G. Gagliardi-Urrutia, D. Rivera González, L. Trevejo, D. Rivera González, and S. Heilpern, eds. 2015. Perú: Tapiche-Blanco. Rapid Biological and Social Inventories Report 27. The Field Museum, Chicago.

Pitman, N., A. Bravo, S. Claramunt, C. Vriesendorp, D. Alvira Reyes, A. Ravikumar, Á. del Campo, D. F. Stotz, T. Wachter, S. Heilpern, B. Rodríguez Grández, A. R. Sáenz Rodríguez and R. C. Smith, eds. 2016. Perú: Medio Putumayo-Algodón. Rapid Biological and Social Inventories Report 28. The Field Museum, Chicago.

Vriesendorp, C., N. Pitman, D. Alvira Reyes, A. Salazar Molano, R. Botero García, A. Arciniegas, L. de Souza, Á. del Campo, D. F. Stotz, T. Wachter, A. Ravikumar and J. Peplinski, eds. 2018. Colombia: La Lindosa, Capricho, Cerritos. Rapid Biological and Social Inventories Report 29. The Field Museum, Chicago.

Pitman, N., A. Salazar Molano, F. Samper Samper, C. Vriesendorp, A. Vásquez Cerón, Á. del Campo, T. L. Miller, E. A. Matapi Yucuna, M. E. Thompson, L. de Souza, D. Alvira Reyes, A. Lemos, D. F. Stotz, N. Kotlinski, T. Wachter, E. Woodward and R. Botero García. 2019. Colombia: Bajo Caguán-Caquetá. Rapid Biological and Social Inventories Report 30. The Field Museum, Chicago.

Jarrett, C. C., M. E. Thompson, N. Pitman, C. F. Vriesendorp, D. Alvira Reyes, A. Alicia Lemos, F. Carrasco-Rueda, W. Matapi Yucuna, A. Salazar Molano, A. Rosita Sáenz Rodríguez, F. Ferreyra, Á. del Campo, M. Morales, A. Alfonso, T. Torres Tuesta, M. Carolina Herrera Vargas, C. García Ortega, V. Cardona Uribe, N. Kotlinski, D. K. Moskovits, L. S. de Souza and D. F. Stotz. 2021. Colombia, Perú: Bajo Putumayo-Yaguas-Cotuhé. Rapid Biological and Social Inventories Report 31. The Field Museum, Chicago.

Pitman, N., C. Rutt, L. S. de Souza, R. E. Oakley, F. Carrasco-Rueda, S. Picq, and J. M. Campbell, eds. 2025. *Guyana: Acarai-Corentyne Corridor.* Rapid Biological and Social Inventories Report 32. Field Museum, Chicago.

Size of the Acarai-Corentyne Corridor (ACC) in hectares	**1,501,775 ha**
Size of the ACC in acres	**3,710,967 acres**
Size of the ACC in square kilometers	**15,018 km^2**
Official terrestrial area of Guyana (https://forestry.gov.gy/)	**214,970 km^2**
Proportion of Guyana's territory occupied by the ACC	**6.99%**
Size of Kanashen Amerindian Protected Area in hectares	**648,567 ha**
Size of the 'Wapichan Headwaters' in hectares	**1,214,504 ha**
Size of the New River Triangle in hectares	**1,353,655 ha**
Percentage of the ACC that is within the Essequibo watershed	**33.5%**
Percentage of the ACC that is within the Corentyne watershed *including the New and Barrington Brown watersheds*	**61%**
Percentage of the ACC that is within the New River watershed	**46.6%**
Percentage of the ACC that is within the Barrington Brown watershed	**8.3%**
Percentage of the ACC that is within the Berbice watershed	**5.5%**
Percentage of the total Essequibo watershed that is within the ACC	**3.2%**
Percentage of the total Corentyne watershed that is within the ACC *including the New and Barrington Brown watersheds*	**13.6%**
Percentage of the total New River watershed that is within the ACC	**43.8%**
Percentage of the total Berbice watershed that is within the ACC	**4.5%**
Percentage of the ACC that is within Region 6	**75.4%**
Percentage of the ACC that is within Region 9	**24.6 %**
Percentage of Region 6 that is inside the ACC	**31.2%**
Percentage of Region 9 that is inside the ACC	**6.7%**

Hectares in the ACC that are bare rock outcrops	**488 ha**
Hectares in the ACC that overlap with the former CI-Guyana concession	**35,491 ha**
Hectares of the former CI-Guyana concession that do not overlap with the ACC	**44,309 ha**
Length of the ACC perimeter	**1165 km**
Length of the ACC perimeter shared with Brazil	**59 km**
Length of the ACC perimeter shared with Suriname	**99 km**
Length of the ACC perimeter shared with Kanashen Amerindian Protected Area	**78 km**
Length of the ACC perimeter that follows the Essequibo River or its tributaries	**487 km**
Length of the ACC perimeter that follows the New River or its tributaries	**402 km**
Longest distance inside the ACC from north to south	**275 km**

Table 15. Locations of the campsites and satellite camps sampled during the November 2024 rapid inventory.

Camp no.	Camp name	Decimal latitude	Decimal longitude	Degrees minutes seconds latitude	Degrees minutes seconds longitude
1	Camp Amuku	1.826931	-58.542721	01° 49’ 36.95” N	58° 32’ 33.8” W
1	Amuku Satellite Camp	1.820361	-58.495735	01° 49’ 13.3” N	58° 29’ 44.65” W
2	Camp Monkey Jump	2.129944444	-58.31061111	02° 07’ 47.8” N	58° 18’ 38.2” W
2	Monkey Jump Satellite Camp	2.074416667	-58.26308333	02° 04’ 27.9” N	58° 15’ 47.1” W
3	Camp New River	3.319691667	-57.61438611	03° 19’ 10.89” N	57° 36’ 51.79” W

Total length of trails at Camp Amuku as measured on the ground (Fig. 4B)	**31,800 m**
Total length of trails at Camp Monkey Jump as measured on the ground (Fig. 4C)	**31,500 m**
Total length of trails at Camp New River as measured on the ground (Fig. 4D) *including the new 2-km trail built during fieldwork*	**18,000 m**
Straight-line distance from Camp Amuku to Camp Monkey Jump	**40 km**
Straight-line distance from Camp Monkey Jump to Camp New River	**153 km**
Straight-line distance from Camp Amuku to Camp New River	**197 km**

Straight-line distance from Camp Amuku to Gunns Strip	**22.7 km**
Straight-line distance from Camp Amuku to Masakeñarî	**24.7 km**
Straight-line distance from Camp Amuku to Parabara	**83.1 km**
Straight-line distance from Camp Monkey Jump to Gunns Strip	**65.2 km**
Straight-line distance from Camp Monkey Jump to Masakeñarî	**66.7 km**
Straight-line distance from Camp New River to Camp Jaguar landing strip	**3.5 km**
Straight-line distance from Camp New River to Cashew Island	**4.7 km**
Straight-line distance from Camp New River to Kwamalasamutu	**141.5 km**
Following-the-river distance from Camp Amuku to Gunns Strip	**23.5 km**
Following-the-river distance from Camp Amuku to the mouth of the Kassikaityu	**2.8 km**
Following-the-river distance from Camp Amuku to Camp Monkey Jump	**48.2 km**
Following-the-river distance from the mouth of Monkey Jump River to the mouth of the Kuywini River	**15.7 km**
Following-the-river distance from Camp Jaguar landing strip to Camp New River	**3.2 km**
Straight-line distance from Ogle to Gunns Strip	**579.0 km**
Straight-line distance from Gunns Strip to Camp Jaguar landing strip	**219.1 km**
Straight-line distance from Camp Jaguar landing strip to Ogle	**395.5 km**
Straight-line distance from Ogle to Apoteri landing strip	**316.9 km**
Straight-line distance from Apoteri landing strip to Camp Jaguar landing strip	**138.1 km**
Straight-line distance from Apoteri landing strip to Gunns Strip	**263.8 km**
Straight-line distance from airstrip at Apoteri to nearest border of the ACC	**32.9 km**
Straight-line distance from the Kanuku Mountains Protected Area to nearest border of the ACC	**32.4 km**
Straight-line distance from the Central Suriname Nature Reserve to nearest border of the ACC	**93.2 km**

Lowest elevation in the ACC	**73 m above sea level**
Highest elevation in the ACC	**873 m above sea level**

Hectares inside the ACC in each of the following elevational ranges:

0–99 m above sea level	**9018 ha**	500–599 m above sea level	**14,521 ha**
100–199 m above sea level	**361,909 ha**	600–699 m above sea level	**5699 ha**
200–299 m above sea level	**1,006,881 ha**	700–799 m above sea level	**1437 h**a
300–399 m above sea level	**78,448 ha**	800–899 m above sea level	**137 ha**
400–499 m above sea level	**23,570 ha**		

Elevation of Camp Amuku	**225 m above sea level**
Elevation of Amuku Satellite Camp	**232 m above sea level**
Elevational range in the trail system at Camp Amuku	**233–714 m above sea level**

Elevation of Camp Monkey Jump	**215 m above sea level**
Elevation of Monkey Jump Satellite Camp	**218 m above sea level**
Elevational range in the trail system at Camp Monkey Jump	**230–318 m above sea level**

Elevation of Camp New River	**140 m above sea level**
Elevational range in the trail system at Camp New River	**158–216 m above sea level**

Distance flown within the ACC during Field Museum overflights before the rapid inventory	**631 km**

PROTECTED		HECTÁREAS	ACRES
01	**Bolivia:** Tahuamanu	1,424,694	3,520,496
02	**Perú:** Cordillera Azul	1,353,191	3,343,807
03	**Ecuador:** Cofán-Bermejo	55,451	137,022
06	**Bolivia:** Bruno Racua	73,799	182,361
11	**Perú:** Tamshiyacu-Tahuayo	420,080	1,038,040
12	**Perú:** Ampiyacu-Apayacu	434,130	1,072,759
15	**Perú:** Megantoni	215,869	533,424
16	**Perú:** Matsés	420,635	1,039,412
17	**Perú:** Sierra del Divisor	1,354,485	3,347,005
17	**Perú:** Sierra del Divisor Zona Reservada	62,235	153,786
18	**Perú:** Nanay-Pintayacu-Chambira	954,635	2,358,954
20	**Perú:** Güeppí-Sekime	203,629	503,178
20	**Perú:** Huimeki	141,234	348,997
20	**Perú:** Airo Pai	247,888	612,545
21	**Ecuador:** Territorio Ancestral Cofan	30,793	76,091
21	**Ecuador:** Cofanes-Chingual	53,094	131,198
21	**Ecuador:** Aguarico-Chingual-Cofanes	101,018	249,621
22	**Perú:** Maijuna-Kichwa	391,040	966,281
23	**Perú:** Yaguas	868,928	2,147,168
28	**Perú:** Medio Putumayo-Algodón	412,369	1,018,986
Total Protected		**9,219,197**	**22,781,132**

REINFORCED		HECTÁREAS	ACRES
04	**China:** Yunnan	405,549	1,002,133
07	**Cuba:** Zapata	434,826	1,074,478
08	**Cuba:** Cubitas	35,810	88,488
09	**Cuba:** Pico Mogote	1,493	3,689
10	**Cuba:** Siboney-Juticí	1,854	4,581
13	**Cuba:** Bayamesa	24,210	59,824
14	**Cuba:** Humboldt	70,680	174,654
19	**Ecuador:** Tierra Comunitaria Dureno	9,703	23,977
20	**Ecuador:** Cuyabeno	594,950	1,470,153
23	**Perú:** Cotuhé Conservation Concession	198,743	491,105
24	**Peru:** Kampankis (Santiago-Comaina)	398,449	984,589
31	**Colombia:** Reserva Forestal Tarapacá	425,471	1,051,362
31	**Colombia:** Amacayacu	262,481	648,605
31	**Colombia:** Rios Cotuhé y Putumayo	255,146	630,479
Total Reinforced		**3,119,365**	**7,708,119**

PROPOSED		HECTÁREAS	ACRES
05	**Bolivia:** Madre de Dios	51,112	126,301
23	**Perú:** Bajo Putumayo	347,699	859,183
25	**Perú:** Ere-Campuya-Algodón	900,491	2,225,162
26	**Perú:** Cordillera Escalera-Loreto	131,193	324,185
27	**Perú:** Tapiche-Blanco	308,612	762,597
29	**Colombia:** Lindosa,Capricho,Cerritos	54,092	133,664
30	**Colombia:** Bajo Caguán-Caquetá	979,742	2,420,995
32	**Guyana:** Acarai-Corentyne Corridor	1,501,775	3,710,967
Total Proposed		**4,274,716**	**10,563,054**

TOTAL	HECTÁREAS	ACRES
Protected	**9,219,197**	**22,781,132**
Reinforced	**3,119,365**	**7,708,119**
Proposed	**4,274,716**	**10,563,054**
TOTAL HECTÁREAS / ACRES	**16,613,278**	**41,052,305**

Cuba
Venezuela
Guyana
Suriname
Colombia
Ecuador
Peru
Brazil
Bolivia
07
08
14
13
10
09
29
30
21
03
19
20
25
28
23
31
18
22
12
24
11
16
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27
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17
06
15
01
05
32

RAPID BIOLOGICAL AND SOCIAL INVENTORIES

In November 2024, local Indigenous experts joined forces with Guyanese and international scientists to explore a vast wilderness of remote rivers and rainforests in southern Guyana. Together, this large multidisciplinary team detailed the complex history and deep ecological knowledge of nearby Indigenous communities, alongside the geology, plants, and vertebrates of this 1.5 million-hectare expanse. What they uncovered—using techniques as time-tested as poison vine fishing and as cutting-edge as environmental DNA—was an abundance of previously undocumented petroglyphs, a spectacular diversity of plants and animals, and an undisturbed landscape that harbors dozens of undescribed species. This report synthesizes those discoveries, consolidating a clear set of ideas about how Guyana can leverage these lands and waters to advance its ambitious conservation goals. The text is in English, with summaries in Waiwai, Wapishana, and Trio.

Participating Institutions

Field Museum of Natural History

Guyana Environmental Protection Agency

Conservation International-Guyana

Frankfurt Zoological Society-Guyana

Map of Life

Guyana Protected Areas Commission

Villages of Masakeñarî, Parabara, and Cashew Island (Kasuela)

University of Guyana

South Rupununi Conservation Society

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